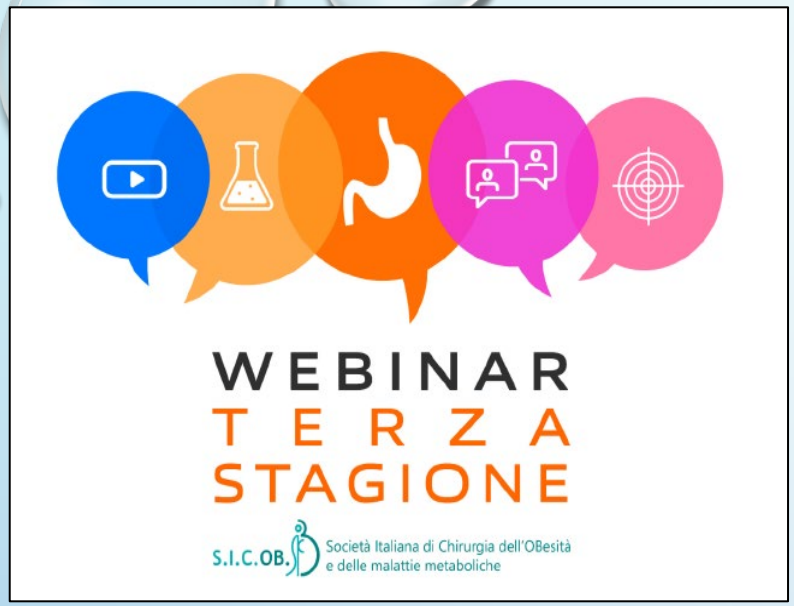

THE PERFECT SLEEVE GASTRECTOMY: ITALIANS DO IT BETTER! (OR NOT?)

CONVERSIONE DA SG A RYGBP

Marcello Lucchese

SOC di Chirurgia Generale e Bariatrica
Ospedale Santa Maria Nuova
Firenze

World J. Surg. 22, 947–954, 1998

WORLD Journal of SURGERY
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Ten-year outcomes after primary vertical sleeve gastrectomy for morbid obesity: a monocentric cohort study

Surg Endosc 2020

P. Hauters[1] · J.-W. Dubart[1] · J. Desmet[1] · R. Degolla[1] · M. Roumain[1] · P. Malvaux[1]

Department of Surgery, Laval Hospital, Laval University, 2725, Chemin Sainte-Foy, Sainte-Foy, Québec, Canada G1K 7PA

Abstract. In 1990 Scopinaro's technique of biliopancreatic diversion with

with the hope of decreasing side effects while preserving the

Update: 10 Years of Sleeve Gastrectomy—the First 103 Patients

Obes Surg 2018

Daniel M. Felsenreich[1] · Lukas M. Ladinig[1] · Philipp Beckerhinn[2] · Christoph Sperker[3] · Katrin Schwameis[1] · Michael Krebs[4] · Julia Jedamzik[1] · Magdalena Eilenberg[1] · Christoph Bichler · Gerhard Prager[1] · Felix B. Langer[1]

after DG and 0.1% per year after DS. The two procedures were equally efficient for treating co-morbid conditions such as diabetes, hypertension, and hypercholesterolemia. Biliopancreatic diversion with sleeve gastrec-

limb of 250 cm. The decision to double the length of the common channel was based on our experience with the often successful treatment of excessive diarrhea and malnutrition by surgical

LONG-TERM RESULTS (8 YEARS) AFTER SLEEVE GASTRECTOMY

SOARD 2017

P. Noel, M. Nedelcu, I. Eddabali, T. Manos, M. Gagner

decreased. Scopinaro et al [1–4] showed that it was possible to decrease nutrient absorption by shortening the functional intestinal length and decrease fat absorption further by diverting

after both procedures, comparing BPD with distal gastrectomy (DG) to BPD with duodenal switch (DS).

10 YEAR FOLLOW-UP AFTER LAPAROSCOPIC SLEEVE GASTRECTOMY: OUTCOMES IN A MONOCENTRIC SERIES

SOARD 2018

L. Castagneto Gissey, JR Casella Mariolo, A. Genco, A. Troisi, N. Basso MD, G. Casella

of morbid obesity [5]. In 1990 two modifications were adopted

Correspondence to: P. Marceau, M.D., Ph.D.

reoperated to restore normal intestinal continuity. Most of these patients were followed yearly by ourselves or their family physicians, who were asked to send their patients' yearly laboratory

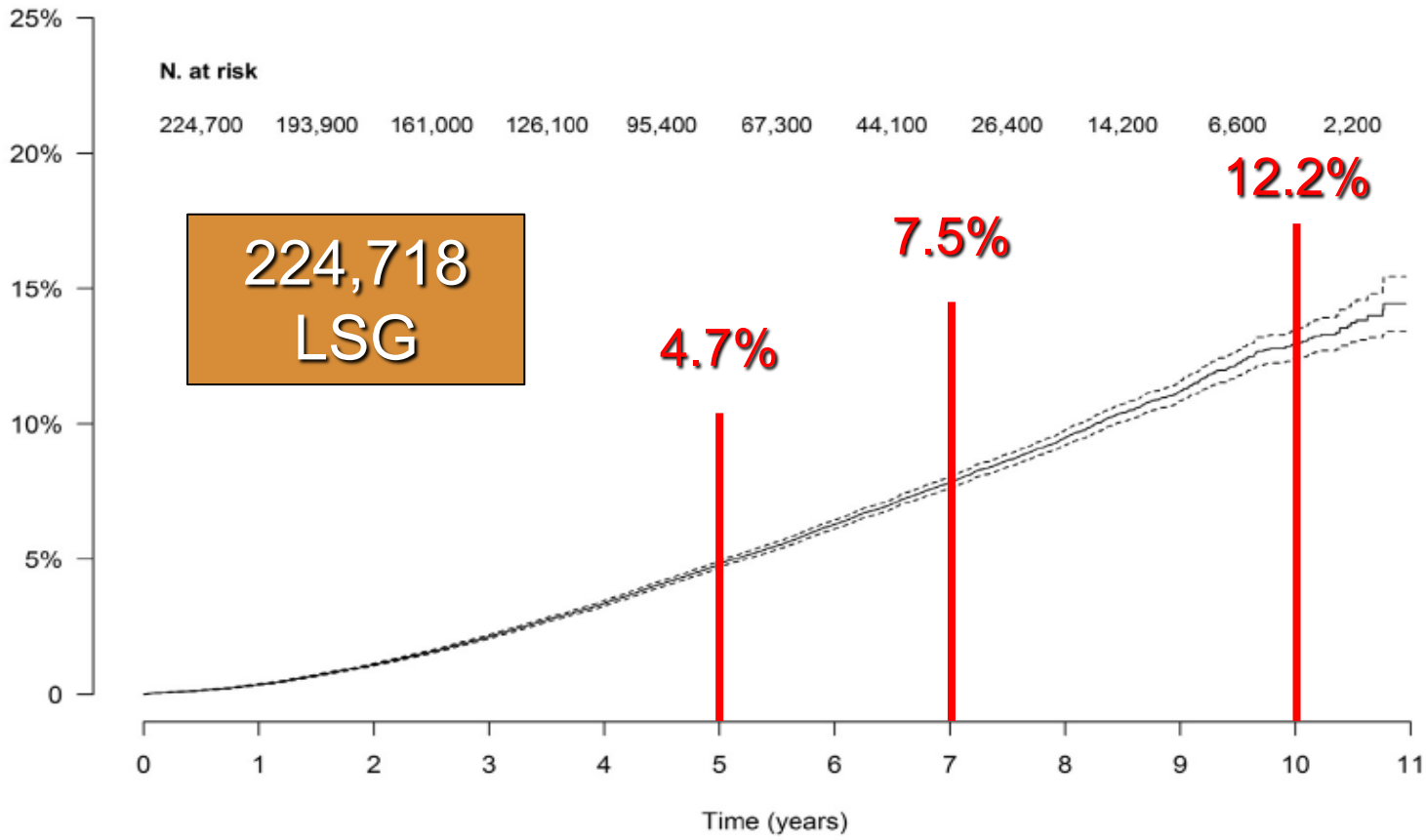
REVISIONE CHIRURGICA: 19.9%

Clapp et al. Long term (7 or more years) outcomes of the sleeve gastrectomy: a meta-analysis. SOARD 2018

Revision surgery after sleeve gastrectomy: a nationwide study with 10 years of follow-up

SOARD 2020

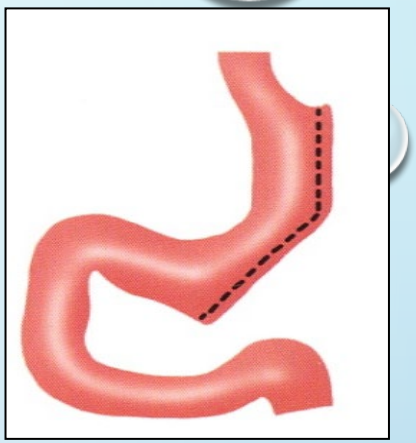
Andrea Lazzati, M.D., Ph.D.[a,*], Stéphane Bechet, M.Sc., A.C.T.I.V.[b], Saadeddinne Jouma, M.D.[a], Luca Paolino, M.D.[a], Camille Jung, M.D., Ph.D.[a,c]

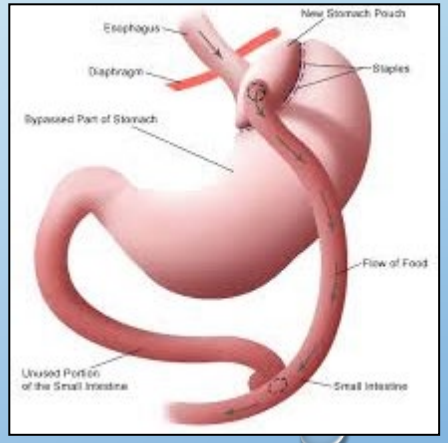


QUALI OPZIONI PER LA REVISIONE?

- ✓ RE-SLEEVE
- ✓ BENDAGGIO
- ✓ RYGB
- ✓ OAGB
- ✓ BPD-DS
- ✓ SADI

CONVERSIONE A RYGB





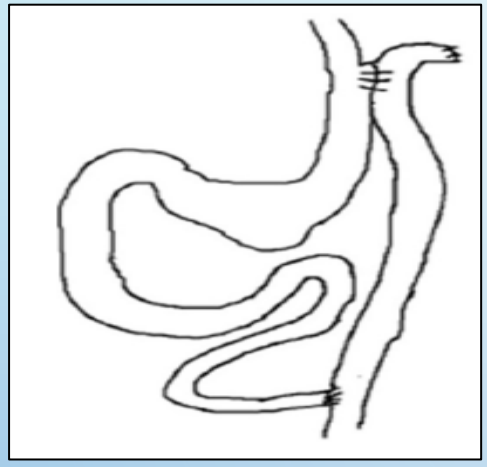
- ✓ COMPLICANZE
  - ➢ Precoci (fistola, stenosi)
  - ➢ Tardive (MRGE)
- ✓ COMPLICANZE METABOLICHE
- ✓ ANDAMENTO DEL PESO
  - ➢ insufficiente calo
  - ➢ recupero ponderale

FISTOLA GASTRICA

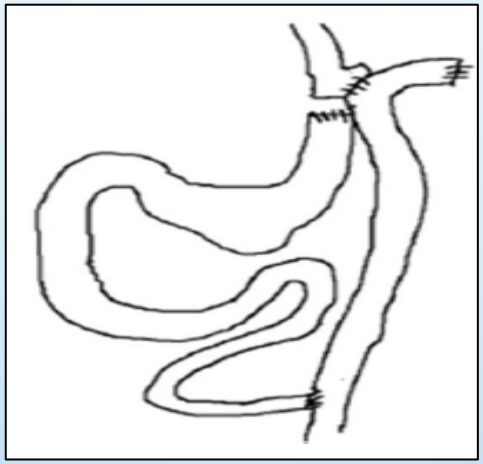
Surgical management for chronic leak following sleeve gastrectomy: Review of literature

SOARD 2019

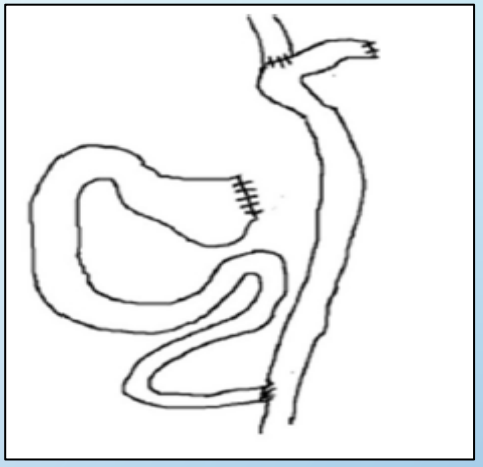
Marius Nedelcu, M.D.[a,*], Marc Danan, M.D., Ph.D.[a], Patrick Noel, M.D., Ph.D.[a,b], Michel Gagner, M.D., F.R.C.S.C., F.A.C.S., F.A.S.M.B.S.[c], Anamaria Nedelcu, M.D.[a], Sergio Carandina, M.D., Ph.D.[a]



Fistulo-digiunostomia



RYGB



Gastrectomia totale

Procedure	Number	Laparoscopic approach	Conversion rate	Leak	Mortality
Total gastrectomy	65 cases	50.8%	3.1%	7.7% (5 cases)	0 cases
Fistulojejunostomy	41 cases	95.1%	7.3%	21.9% (9 cases)	1 case
RYGB	8 cases	75%	0%	37.5% (3 cases)	1 case

Malignant Leakage After Sleeve Gastrectomy: Endoscopic and Surgical Approach

Obes Surg 2020

Robert Caiazzo[1,2] • Camille Marciniak[1,2] • Ninon Wallach[3] • Magalie Devienne[4] • Gregory Baud[1,2] • Jean-Baptiste Cazauran[3] • Eric Kipnis[5] • Julien Branche[6] • Maud Robert[3] • François Pattou[1,2]

	p value	Exp (*B*) (IC 95%)
Age (years)	0.380	0.97 [0.91–1.04]
BMI at referral (kg/m^2)	0.442	0.97 [0.88–1.06]
Median time to referral center (days)	0.069	1.05 [1.00–1.10]
Previous gastric procedures	0.991	1.01 [0.16–6.54]
Anatomical anomalies	0.020	0.17 [0.04–0.76]
Gastro-cutaneous/pleural fistula	0.001	0.07 [0.02–0.34]
Localized peritonitis	0.196	2.10 [0.55–8.08]
SLD size > 10 mm	0.737	0.79 [0.20–3.08]

CRONICIZZAZIONE DEL LEAK

100 LSG CON LEAK CRONICO

TRATTAMENTO CHIRURGICO: 37%

1.20
STENOSI

An Algorithmic Approach to the Management of Gastric Stenosis Following Laparoscopic Sleeve Gastrectomy

Abhishek Agnihotri[1] · Sindhu Barola[2] · Christine Hill[3] · Manoel Galvao Neto[4] · Josemberg Campos[5] · Vikesh K Singh[2] · Michael Schweitzer[6] · Mouen A Khashab[2] · Vivek Kumbhari[2,7]

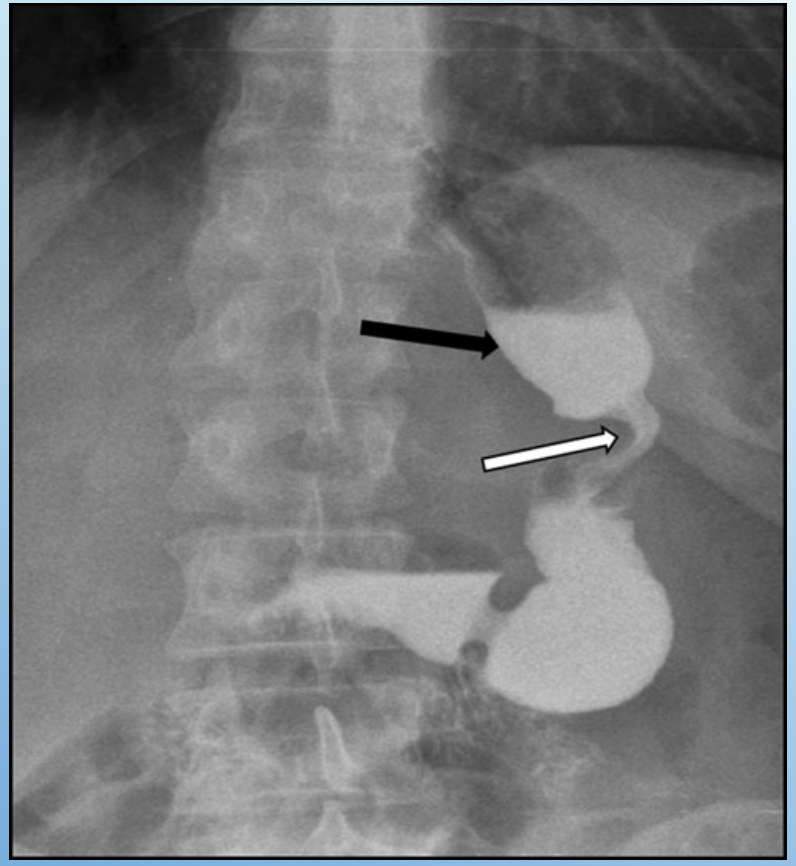
Obes Surg 2017

Patient ID	Achalasia balloon dilations performed	Total number of balloon dilations	Wallflex™ FCSEMS placement	Duration of Wallflex™ FCSEMS placement	Niti-S FCSEMS Taewoong FCSEMS placement	Surgical intervention
1	35 mm	1	23 × 120 mm	8 days		
2	30 mm > 30 mm > 35 mm	3				
3	30 mm > 35 mm > 35 mm	3				RYGB
4	30 mm	1				
5	30 mm > 30 mm	2				
6	30 mm > 35 mm	2	23 × 120 mm	43 days	18 × 60mm	
7	30 mm > 30 mm > 35 mm	3	23 × 120 mm	28 days	18 × 60mm	
8	30 mm > 35 mm > 35 mm > 35 mm	4				
9	30 mm	1				RYGB
10	30 mm	1				
11	30 mm	1				
12	30 mm	1				
13	30 mm	1				
14	30 mm	1				
15	30 mm > 35 mm	2				
16	30 mm > 35 mm	2				
17	30 mm > 35 mm	2				

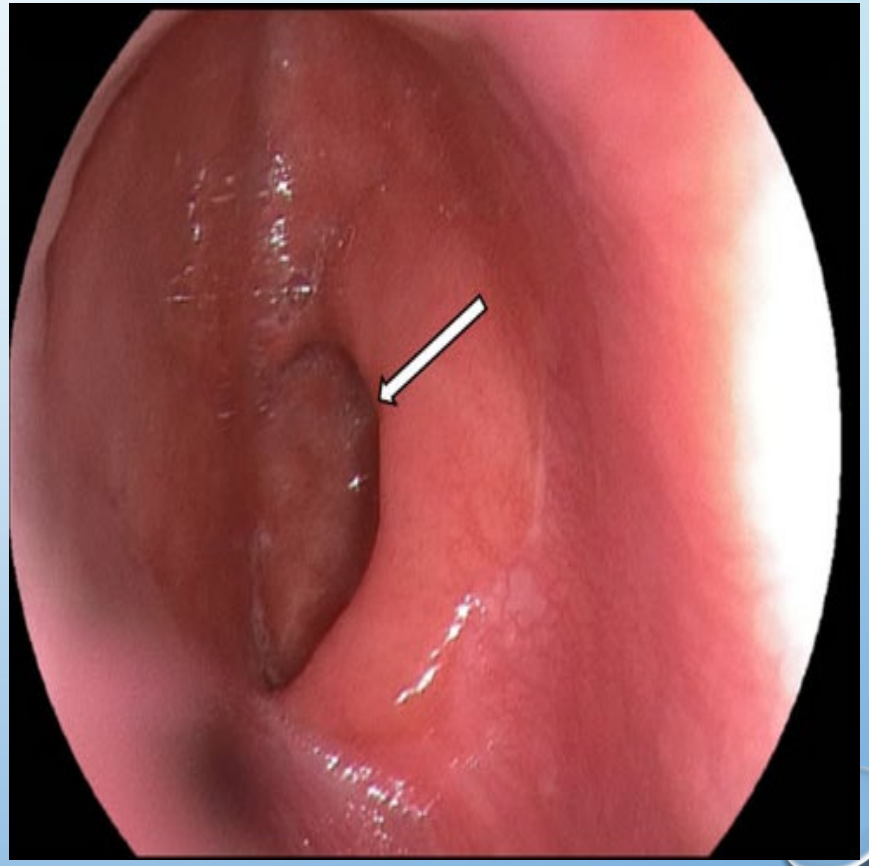
Gastric Stenosis After Laparoscopic Sleeve Gastrectomy: Diagnosis and Management

Lionel Rebibo[1] · Sami Hakim[2] · Abdennaceur Dhahri[1] · Thierry Yzet[3] · Richard Delcenserie[2] · Jean-Marc Regimbeau[1,4,5]

Obes Surg 2016



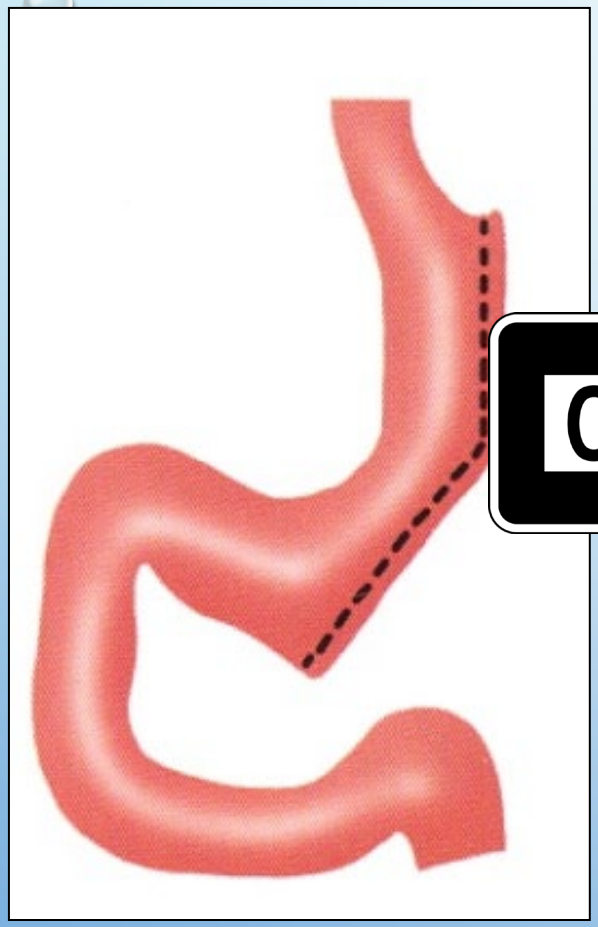
VS

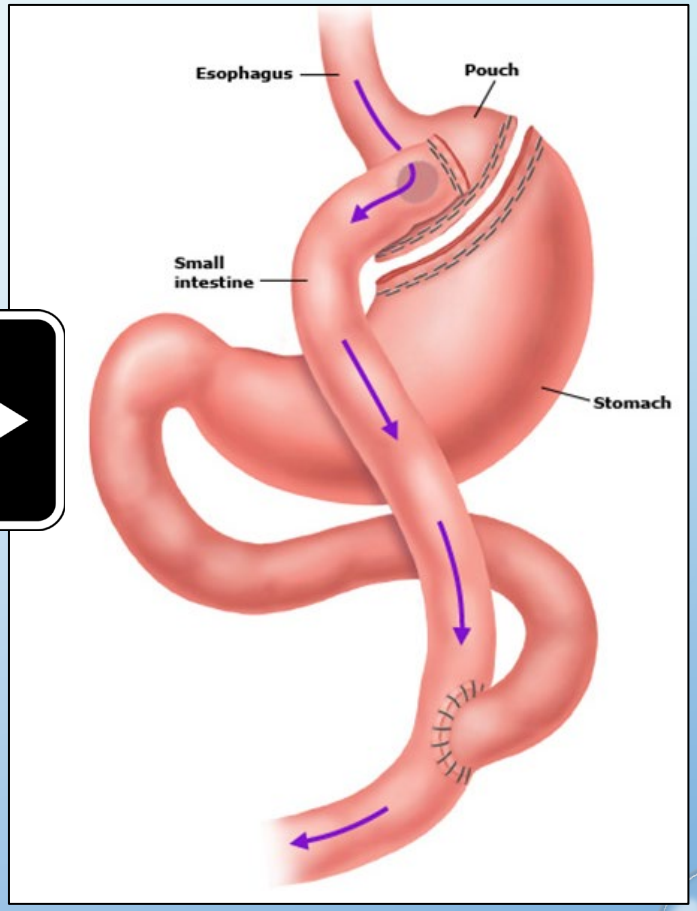


ORGANICA

FUNZIONALE

REFLUSSO INTRATTABILE DOPO LSG





Does Sleeve Gastrectomy Expose the Distal Esophagus to Severe Reflux?

A Systematic Review and Meta-analysis

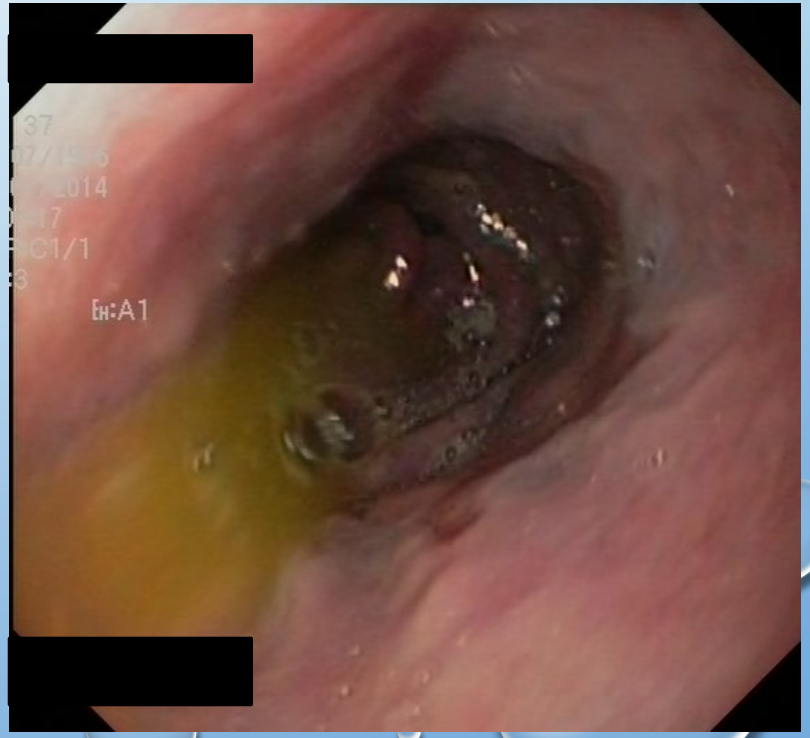
Ann Surg 2020

Kai Tai Derek Yeung, BMBS, MRCS, Nicholas Penney, MBBS, MRCS, Leanne Ashrafian, PhD, MRCS, Ara Darzi, MD, FRCS, FACS, FMedSci, FRS, and Hutan Ashrafian, PhD, MRCS, MBA

Outcome	All Studies	Long Term (>24 mo)
Overall increase in reported reflux	19%	19%
De novo reflux	23%	20%
Esophagitis found	30%	28%
Barrett's esophagus	6%	8%
Postoperative hiatus hernia rate	41%	—
PPI use (postoperative)	38%	36%
Revision to RYGB for severe reflux	4%	4%
BMI change	-13.29 kg/m^2	-12.56 kg/m^2
EWL	62%	61%
Diabetic resolution	66%	66%
GERD 2018 Lyon Consensus criteria (borderline)	37%	—
GERD 2018 Lyon Consensus criteria (conclusive)	8%	—

MECCANISMI FISIOPATOLOGICI

- ✓ Riduzione della secrezione acida
  (fondo gastrico ritenuto)
- ✓ Abolizione del reflusso biliare
- ✓ Eventuale iatoplastica

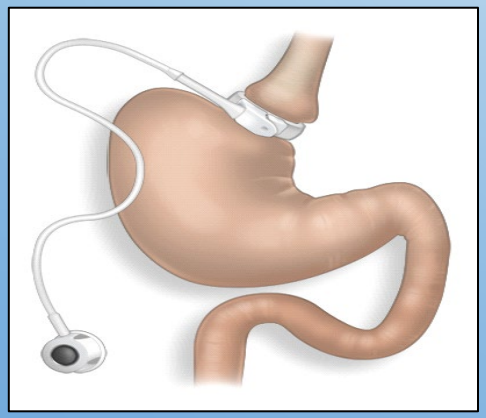


Conversion of sleeve gastrectomy to Roux-en-Y gastric bypass in patients with gastroesophageal reflux disease: results of a multicenter study

Sergio Carandina, M.D.[a,b,*], Antoine Soprani, M.D.[c], Laura Montana, M.D.[d], Sebastien Murcia, M.D.[e], Antonio Valenti, M.D.[f], Marc Danan, M.D.[a], Jacopo d'Agostino, M.D.[g], Emmanuel Rivkine, M.D.[h], Marius Nedelcu, M.D.[a]

SOARD 2020

80 LSG → RYGB	RISOLUZIONE MRGE 71.2%	PREGRESSO BENDAGGIO 57.8%
		NO PREGRESSO BENDAGGIO 88.5%



RISCHIO PERSISTENZA MRGE X 3

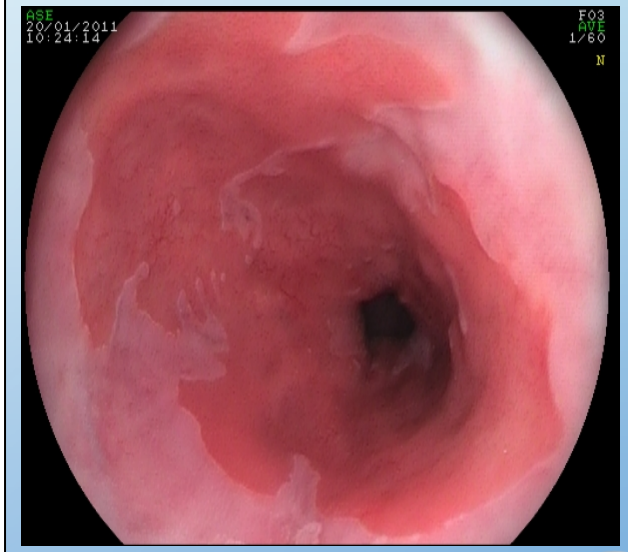
Roux-en-Y Gastric Bypass as a Treatment for Barrett's Esophagus after Sleeve Gastrectomy

Obes Surg 2020

Daniel M. Felsenreich[1] · Felix B. Langer[1] · Christoph Bichler[1] · Magdalena Eilenberg[1] · Julia Jedamzik[1] · Natalie Vock[1] · Lisa Gensthaler[1] · Charlotte Rabl[2] · Alexander Todoroff[3] · Gerhard Prager[1]

LSG → 42.7 ±14.9 mesi → RYGB

	Gastroscopy before SG ($n = 10$)	Gastroscopy before RYGB ($n = 10$)	Gastroscopy after RYGB ($n = 10$)
Hiatal hernia	0%	20.0*%	0%*
Esophagitis	0%	80.0%	20.0%
Barrett's esophagus	0%	100%	20.0%
Helicobacter pylori	0%	0%	0%



FOLLOW-UP POST-RYGB: 33 MESI

MANOMETRIA / pH-METRIA

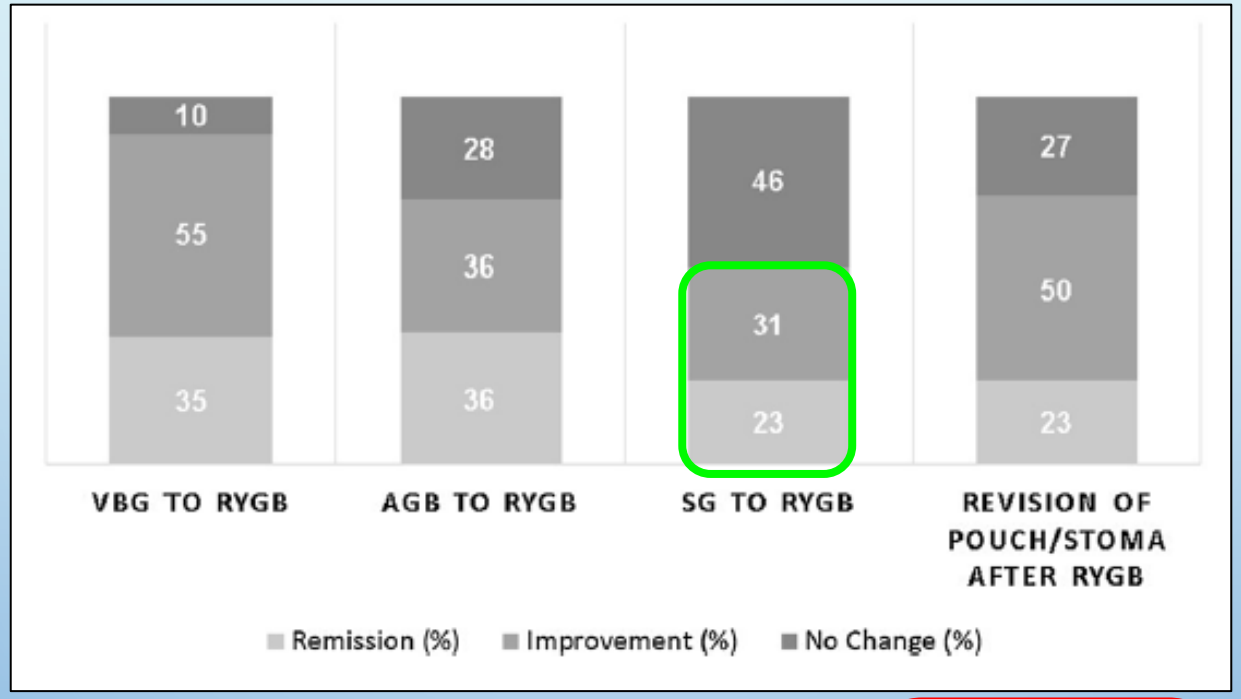
	Manometry 24 h-pH-metry before RYGB ($n = 5$)	Manometry 24 h-pH-metry after RYGB ($n = 9$)	p value
LESP (normal 10–35 mmHg)	10.6 ± 6.7	16.3 ± 4.1	0.34
Acid exposure time (%) in 24 h (normal < 4.2%)	36.8 ± 21.6	3.8 ± 4.6	*0.004*
Total number or refluxes in 24 h (normal < 73)	162 ± 113	49 ± 35	*0.04*
DeMeester score (normal < 14.72)	110.0 ± 51.1	16.3 ± 14.2	*0.005*

Felsenreichet al. Obes Surg 2020

Effect of revisional bariatric surgery on type 2 diabetes mellitus

Surg Endosc 2019

Essa M. Aleassa[1,2] · Monique Hassan[1] · Kellen Hayes[1] · Stacy A. Brethauer[1] · Philip R. Schauer[1] · Ali Aminian[1]



Insulin use	VBG to RYGB ($n = 20$)	Conversion from AGB			Conversion from SG		Revision of pouch/ stoma after RYGB ($n = 22$)
		AGB to RYGB ($n = 14$)	AGB to SG ($n = 7$)	AGB to DS ($n = 2$)	SG to RYGB ($n = 13$)	SG to DS ($n = 3$)	
At revision (n)	9	9	2	1	8	3	7
At last follow-up (n)	5	7	1	0	6	0	7
Discontinuation of insulin (%)	44.4	22.2	50	100	25	100	0

INSUFFICIENTE CALO – RECUPERO PONDERALE

POSSIBILI CAUSE

- **ABITUDINI DIETETICHE– CAUSE PSICOLOGICHE**
- **BMI INIZIALE** (> 50 kg/m^2)
- **PRECEDENTE CHIRURGIA BARIATRICA** (SG come revisione)
- **SLEEVE «PRIMARIA» INADEGUATA** (errore tecnico)
- **DILATAZIONE** (primaria/secondaria)

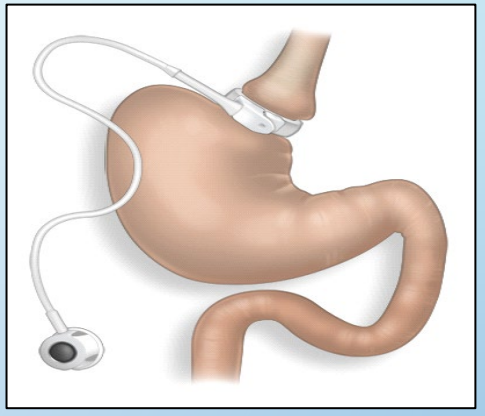
Revision surgery after sleeve gastrectomy: a nationwide study with 10 years of follow-up

SOARD 2020

Andrea Lazzati, M.D., Ph.D.[a,*], Stéphane Bechet, M.Sc., A.C.T.I.V.[b], Saadeddinne Jouma, M.D.[a], Luca Paolino, M.D.[a], Camille Jung, M.D., Ph.D.[a,c]

FATTORI PREDITTIVI DI INSUCCESSO DELLA SLEEVE

Covariate	Hazard ratio	*P* value
Sex, female	1.35 (1.27–1.44)	<.001
BMI, 40–50 kg/m^2	1.46 (1.38–1.54)	<.001
BMI, >50 kg/m^2	2.70 (2.52–2.89)	<.001
History of adjustable gastric banding	2.81 (2.66–2.95)	<.001
Overall diabetes	2.02 (1.86–2.18)	<.001
OSAS	.80 (.76–.85)	<.001
Any malignant neoplasm, including leukemia and lymphoma	.70 (.56–.87)	<.01
Overall liver disease	.83 (.77–.90)	<.001

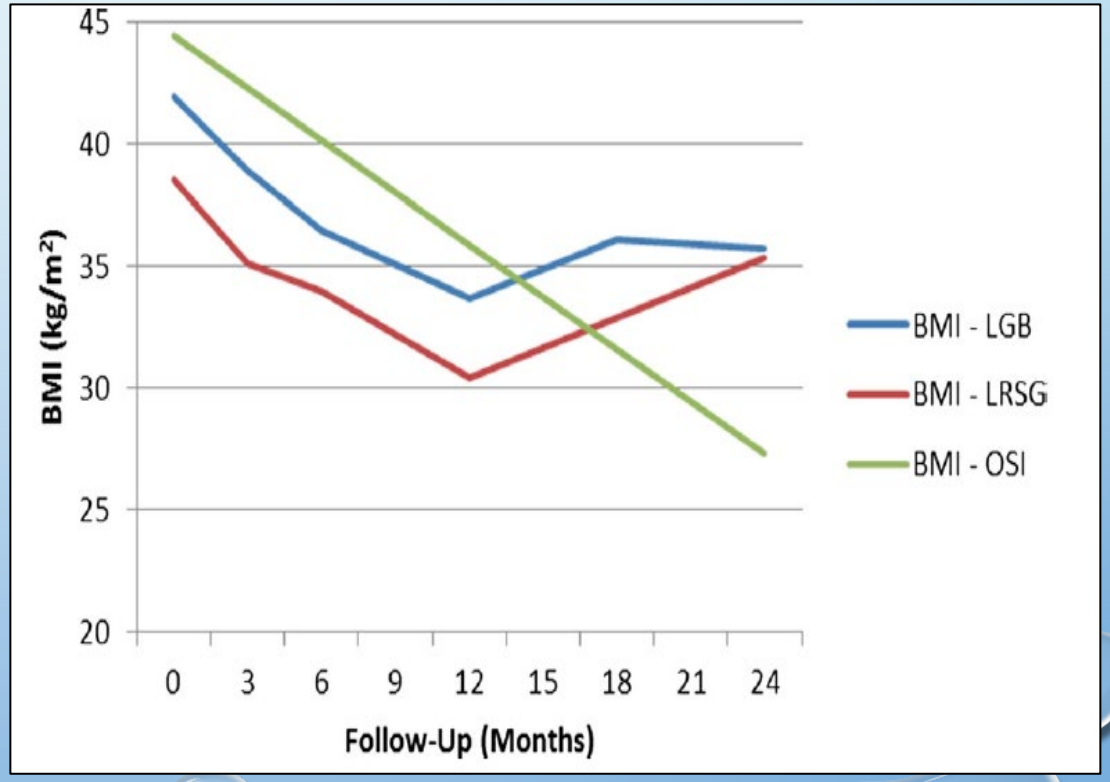


Revisional Bariatric Surgery Following Failed Primary Laparoscopic Sleeve Gastrectomy: A Systematic Review

Douglas Cheung • Noah J. Switzer • Richdeep S. Gill • Xinzhe Shi • Shahzeer Karmali

Obes Surg
2014

- 114 Bypass (LGB)
- 45 Re-Sleeve (LRSG)
- 59 BPD-DS (OSI)



Parameters	Weight before SG	Weight at conversion to RYGB	6 months post RYGB ($N = 8$)	12 months after RYGB ($N = 11$)	24 months after RYGB ($N = 7$)
Mean weight (kg)	152.1 (115.2–224)	123.8 (82.8–173.1)	109.9 (72.2–163)	114.6 (70.6–167)	116.1 (88–162)
Mean BMI (kg/m^2)	53.1 (42.3–66.2)	43.3 (34.6–54.4)	38.2 (31–46.1)	39.9 (30.4–47.6)	40.8 (32.3–48.1)
EWL (%)	–	36.1 (24.4–45.5)	49.9 (32.8–68.9)	49.5 (33.7–72.5)	46 (32.3–57.7)

Parmar CD et al. Obes Surg 2017

	At time of surgery	Mean 24 months follow-up (20\23)
Mean BMI (kg/m^2)	41.6 (SD 3.58)	33.8 (SD 5.25)
EBMIL (%)		42.6%
Objective failure, no. (%)		
BMI > 35		8 (34%)
EBW > 50%		5 (21.7%)
Diabetes, no. (%)	6 (26%)	4 (17%)
Medication, no. (%)	5 (21%)	3 (13%)
Hypertension, no. (%)	9 (39%)	5 (21%)
Medication, no. (%)	6 (26%)	4 (17%)
Hyperlipidemia, no. (%)	6 (26%)	3 (13%)
Medication, no. (%)	4 (17%)	3 (13%)

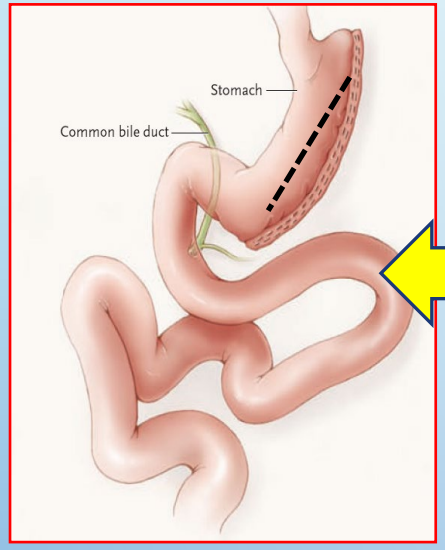
Nevo N et al. Obes Surg 2018

INTERVENTO INEFFICACE O IMPROPRIA SELEZIONE DEL PAZIENTE?

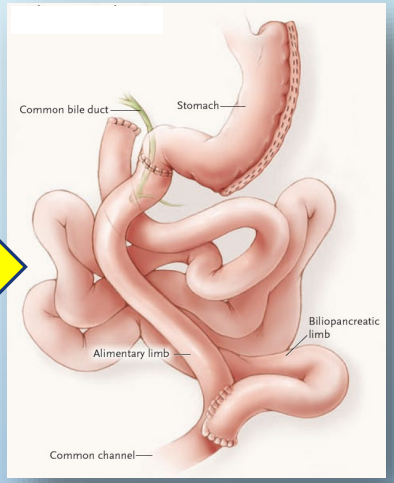
VALUTAZIONE MULTIDISCIPLINARE PRE-OPERATORIA

«PROFILO» IDEALE PER LA CONVERSIONE A RYGB

- No DA/psichiatrici
- Dilatazione fondo gastrico con eventuale MRGE
- BMI pre-Sleeve < 50 kg/m^2
- No 2^ revisione (pregresso band)
- Comorbidità metaboliche persistenti



RE-SLEEVE



BPD-DS (OAGB - SADI?)

COMPLICANZE

RISULTATI

CONCLUSIONI

- La conversione chirurgica della Sleeve gastrectomy ha un'incidenza del 10-20%

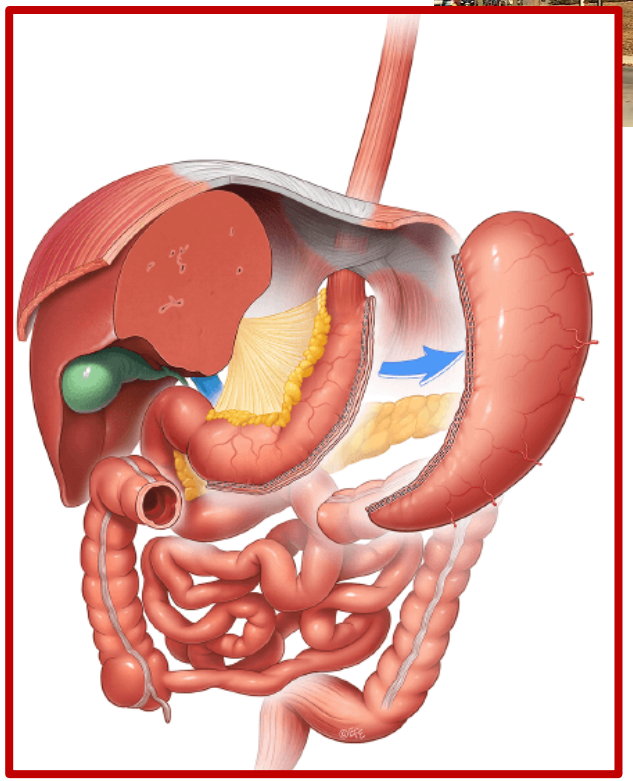
- L'indicazione principale alla conversione a RYGBP è rappresentata da una MRGE intrattabile

- In caso di insufficiente calo o recupero ponderale dopo Sleeve gastrectomy, la conversione a RYGBP deve scaturire da un'accurata valutazione multidisciplinare pre-operatoria, al fine di evitare il fallimento della procedura di revisione

GRAZIE PER
L'ATTENZIONE

S.I.C.OB.
Società Italiana di Chirurgia dell'Obesità e delle Malattie Metaboliche

THE PERFECT SLEEVE GASTRECTOMY: ITALIANS DO IT BETTER! (OR NOT?)



SLEEVE GASTRECTOMY NEI PAZIENTI CON GERD, SI

Stefano Olmi

Chirurgia Generale ed Oncologica
Centro di Chirurgia Laparoscopica Avanzata
Centro di Chirurgia dell'Obesità
Policlinico San Marco – GSD
Zingonia (BG) - Italy

GRUPPO OSPEDALIERO SAN DONATO

Incidenza globale di *GERD* nel paziente bariatrico ***62.4%***

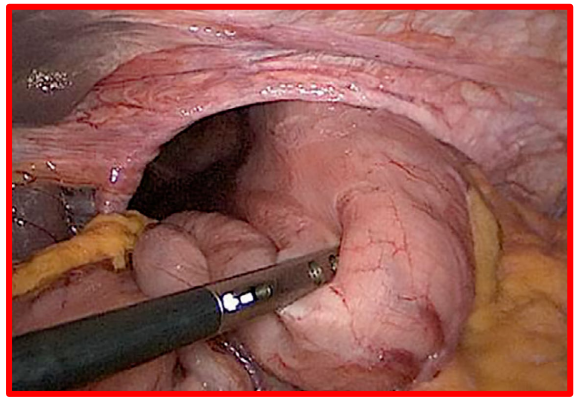
Incidenza di *esofagite grado B e C* nell'obesità patologica ***33.9%***

Incidenza di esofago di *Barrett* ***0.6%***

Endo et al, Surg Today. 2019

Incidenza di *ernia iatale* nei pazienti bariatrici circa ***20%***

Mani et al, Surg Obes Relat Dis. 20

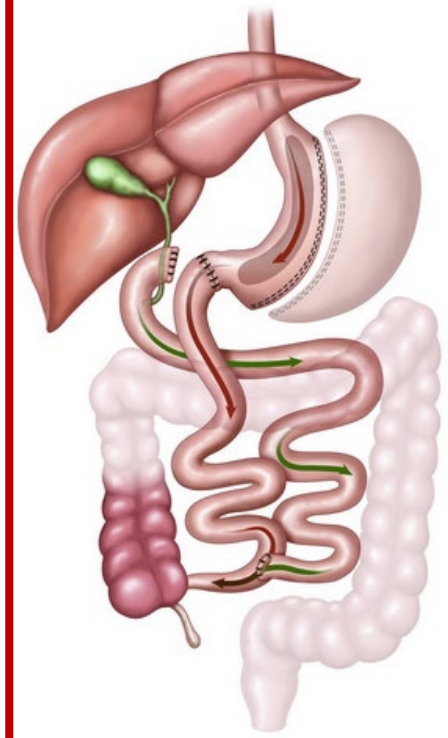


OBES SURG (2008) 18:487–496
DOI 10.1007/s11695-008-9471-5

CONSENSUS SUMMIT

The First International Consensus Summit for Sleeve Gastrectomy (SG), New York City, October 25–27, 2007

Mervyn Deitel · Ross D. Crosby · Michel Gagner



Dr. Jossart discussed GERD and strictures. In his experience, 30% of patients have some vomiting early postoperatively. It is important to use a firm bougie and avoid narrowing at the angularis. He starts the dissection 4 cm proximal to the pylorus [21]. If a hiatal hernia is present, he approximates the crura posteriorly with a few Ethibond sutures because a wrap is impossible. He completes all gastric dissection before repairing the hiatal hernia. One must avoid stapling the esophagus. He orders a PPI for at least 2 months postoperatively.

7. *Are complications following SG less frequent and lesser in magnitude than after RYGBP?* Thirty-two percent completely agreed and 41% somewhat agreed. It was generally agreed that the incidence of leaks after SG occurred at about the same frequency as after RYGBP. The Consensus found that strictures after SG are less frequent than after RYGBP. However, GERD after SG is significantly more frequent than after RYGBP. Regarding refractory GERD after SG, 39% would use medical treatment, 12% would use laparoscopic hiatal hernia repair (possibly with resleeve), and 44% would convert to a RYGBP.

Sin dalla prima Consensus (2007),
il problema del GERD è stato riconosciuto.

All'inizio della diffusione della LSG, essendo la tecnica concepita come il primo tempo di un intervento bariatrico di RYGB o DS, lo studio preoperatorio del GERD non rappresentava ancora un problema così importante: il secondo intervento (RYGB in particolare) permetteva di risolvere GERD, esofagiti, BE

Symposium review

The Second International Consensus Summit for Sleeve Gastrectomy, March 19–21, 2009

Michel Gagner, M.D., F.R.C.S.C., F.A.C.S.[a,*],
Mervyn Deitel, M.D., C.R.C.S.C., F.A.C.N., F.I.C.S.[b], Traci L. Kalberer, B.A.[c],
Ann L. Erickson, B.A.[c], Ross D. Crosby, Ph.D.[d]

[a]*Department of Surgery, Mount Sinai Medical Center, Miami Beach, Florida*
[b]*Editor-in-Chief Emeritus and Founding Editor, Obesity Surgery, Toronto, Ontario, Canada*
[c]*Research Data Technician/Research Associate, Neuropsychatric Research Institute, Fargo, North Dakota*
[d]*Director of Biomedical Statistics, Neuropsychiatric Research Institute, Fargo, North Dakota*

Con il progredire della diffusione della tecnica come intervento singolo bariatrico, il panel di esperti nel 2009 controindica la procedura anche come «primary operation» nei casi di «severe GERD»

The consensus summit

On the last day of the conference, a consensus was determined by a series of questions voted upon, using Meridia Audience Response (Meridia Audience Response, Philadelphia, PA). The questions were discussed by panels of experts representing SG and the spectrum of bariatric operations, and a final vote was taken on each question, as indicated below. There were about 165 responses per question.

1. *What is the mechanism of action of the SG?* Restriction 79%, gastric emptying 0%, hormonal 16%, malabsorption 0%, other 3%.
2. *Recent studies on gastric emptying after SG demonstrate:* Faster gastric emptying 26%, slower gastric emptying 1%, no change in gastric emptying 7%, contradictory results with more studies needed 65%.
3. *Ghrelin production is most suppressed after:* SG 90%, RYGB 4%, gastric banding 1%, DS 3%, classic BPD 0%.
4. *Should the SG be considered a primary operation for portal hypertension with varices?* Yes 30%, no 69%.
5. *Should SG be considered a primary operation for adolescents 12–17 years old?* Yes 60%, no 40%.
6. *Should SG be considered a primary operation for men with BMI >70 kg/m^2?* Yes 85%, no 14%.
7. *Should SG be considered a primary operation for severe gastroesophageal reflux?* Yes 11%, no 88%.
8. *Should SG be considered a primary operation for diabetic gastroparesis?* Yes 54%, no 45%.
9. *Should SG be considered a primary operation with severe psychiatric disease?* Yes 41%, no 58%.
10. *Should SG be considered a primary operation with Crohn's disease?* Yes 82%, no 17%.
11. *What is the best operation for a patient with BMI 35–50 kg/m^2 with poorly controlled type 2 diabetes mellitus?* Gastric banding 7%, SG 34%, RYGB 50%, DS 6%.

Third International Summit: current status of sleeve gastrectomy

Mervyn Deitel, M.D., F.A.S.M.B.S., C.R.C.S.C.[a,*],
Michel Gagner, M.D., F.A.S.M.B.S., F.A.C.S., F.R.C.S.C.[b], Ann L. Erickson, B.A.[c],
Ross D. Crosby, Ph.D.[d]

The problem of hiatal hernia and reflux

del Genio et al. [42] performed 24-hour pH manometry and multichannel intraluminal impedance plus endoscopy before LSG in 15 consecutive patients who had no preoperative symptoms of gastroesophageal reflux disease (GERD), hiatal hernia (HH), or Barrett's esophagus. These studies were repeated >1 year after LSG, at which point the mean %EWL was 56%. The studies after weight loss found that the lower esophageal sphincter pressure (LESP) had not changed, but there were increased ineffective secondary waves with an increase in nonacid reflux during the day. A correctly fashioned sleeve was an effective restrictive procedure that increased the postprandial reflux episodes but did not induce GERD. When there had been GERD preoperatively, they approximated the crura during the LSG operation. However, they did not perform LSG in patients with severe reflux. Also, Barrett's esophagus is contraindicated for LSG because of the danger of Barrett's progressing to carcinoma.

International Sleeve Gastrectomy Expert Panel Consensus Statement: best practice guidelines based on experience of >12,000 cases

Raul J. Rosenthal, M.D., F.A.C.S., F.A.S.M.B.S.*, for the International Sleeve Gastrectomy Expert Panel

Received October 26, 2011; accepted October 27, 2011

Himpens et al. [52] presented 6-year follow-up data for LSG that had been performed in 2001 and 2002. There was a biphasic pattern of reflux—early and late. Similar to the findings from Braghetto et al. [48], they found an increase in GERD to 6 months postoperatively. Up to 6 months, this could be from poor patient compliance, which improves. However, Himpens et al. [52] then found a decrease in GERD to 3 years. From 3 to 6 years, GERD symptoms increased to 21%, usually after meals and never at night, indicating this is not true reflux but stasis. At 3 years, the %EWL was 73%, which at 6 years had decreased to 53%, because the patients had started to consume junk food and carbohydrates. The 6-year increase in reflux paralleled the increase in BMI. At 6 years, there was also fundic regrowth, forming a neostomach.

Nel 2011 il GERD grave viene ancora considerato controindicazione alla LSG. Ma la consensus non si esprime ancora rispetto allo studio preoperatorio del GERD.

Il GERD de novo viene riconosciuto complicanza sia precoce che tardiva.

Il BE viene confermato controindicazione a LSG.

Vengono introdotte nella discussione le varianti alla LSG con associati interventi anti-reflusso e il trattamento dell'ernia iatale

La *correzione dell'ernia iatale* è fondamentale nel trattamento dei sintomi da MRGE nel paziente bariatrico; la corretta iatoplastica si correla ad un tasso di remissione dei sintomi pari ad oltre il *90%*

Daes et al, Obes Surg. 2012

Survey on laparoscopic sleeve gastrectomy (LSG) at the Fourth International Consensus Summit on Sleeve Gastrectomy

Michel Gagner · Mervyn Deitel · Ann L. Erickson · Ross D. Crosby

The occurrence of GERD has been reported [26] but remains a controversial issue after the LSG. Himpens' group found early true reflux and late regurgitation due to over-eating in some patients postoperatively [12, 27]. However, Chiu and co-workers [28] in a review reported that most studies found no increase in GERD after LSG. Tai et al. [29] found postoperative GERD and erosive gastritis to be related to the presence of a HH. An increase in lower esophageal sphincter pressure accompanied by a decrease in GER has been reported when narrow lesser curvature gastric tubes are constructed [30, 31]; the lesser curvature open inner transverse C-shaped muscle (sling) fibers are approximated, increasing intraluminal tension (Laplace's law). Abnormal esophageal motility has been found in morbidly obese individuals, but without GER [32]. The observed fact that the stomach appears to empty rapidly after sleeve gastrectomy [33] should tend to decrease GERD. The issue is still in dispute, but most surgeons repair a HH (when present) at LSG, and if there is a high degree of GERD and/or a large HH, most would perform a Roux-en-Y gastric bypass [15, 27, 34, 35]. Both Soricelli et al. [35] and Daes et al. [36] found that searching for and repairing a HH at the LSG operation decreases GER significantly.

2013: con l'avanzare del follow-up e della diffusione della tecnica, il problema del GERD de novo e delle sue conseguenze (esofagiti) inizia ad essere riportato da alcuni autori.

Altri studi riportano un non incremento del GERD nei pazienti sottoposti a LSG.

Il dibattito resta aperto: l'associazione GERD e HH porta molti autori a privilegiare RYGB piuttosto che LSG

Fifth International Consensus Conference: current status of sleeve gastrectomy

Michel Gagner, M.D., F.R.C.S.C., F.A.C.S., F.A.S.M.B.S.[a,b], Colleen Hutchinson, M.A.[c], Raul Rosenthal, M.D., F.A.C.S., F.A.S.M.B.S.[c,*]

[a]*Herbert Wertheim College of Medicine, Florida International University, Miami, Florida*
[b]*Department of Surgery, Hopital du Sacre Coeur, Montreal, Quebec, Canada*
[c]*Cleveland Clinic Florida, Weston, Florida*

Received January 14, 2016; accepted January 21, 2016

Regarding gastroesophageal reflux, not all experts agree on the fact that formal pH and manometry should be performed on these patients. This reflects the current controversy on this topic; several papers point out an increase in incidence of reflux after sleeve gastrectomy, whereas others such as Morino et al. [50] report only 5% GERD de novo after 2 years. Hence, only one third of experts would propose such studies preoperatively and certainly not routinely, but very selectively. From this excellent study, it has been concluded that in fact GERD is improved after sleeve gastrectomy and it should not be a contraindication, contrary to the mindset of the general bariatric surgeon, 53% of whom would not perform a sleeve in such scenario. For GERD that persists after sleeve gastrectomy, newer methods of treatment are emerging, especially endoscopic options (Stretta procedure, LINX magnetic collar, endoluminal fundoplication), and laparoscopic options (modified Hill's repair, partial fundoplication, hiatal hernia repair, and round ligament wrapping). Experts believe that converting to RYGB may not be the best option (or the first) all the time (80% versus 97% for general bariatric surgeons, $P < .005$).

2016: lo studio preoperatorio con pHmetria e manometria viene proposto per meglio inquadrare il GERD nell'obeso.

La questione «LSG sì o no» in paziente con reflusso è però ancora fortemente dibattuta, senza consenso unanime.

Unico punto sempre fermo della consensus:
BE è controindicazione

Contraindications for performing LSG surgery included Barrett's esophagus (80.0%), gastroesophageal reflux disease (GERD; 23.3%), hiatal hernias (11.7%), and BMI >60 (5%).

Standardization of Bariatric Metabolic Procedures: World Consensus Meeting Statement

Mohit Bhandari[1] · M. A. L. Fobi[1] · Jane N. Buchwald[2] ·
and the Bariatric Metabolic Surgery Standardization (BMSS) Working Group:

Indications/Contraindications, Weight Loss, Diabetes Resolution Indications for SG include patients considered at high risk, including morbidly obese patients with metabolic syndrome, liver and kidney transplant patients, and patients with BMI 30–35 kg/m^2 with comorbidities [29]. Primary relative contraindications are the presence of severe gastroesophageal reflux disease (GERD) and/or Barrett's esophagus and hiatal hernias [19, 30]. In a 2017 systematic review, weight loss with SG at the 5-year point (20 included studies, n = 1626 at 5 years) was 58.4% [31]. For patients with T2DM, SG is an effective long-term metabolic surgery. Five-year outcomes for 402 T2DM patients reported in a 2016 systematic review (11 included studies, n = 1354) showed T2DM resolved in 60.8%, mean fasting plasma glucose (FPG) levels

Barrett's Oesophagus and Bariatric/Metabolic Surgery—IFSO 2020 Position Statement

Oliver M. Fisher[1] · Daniel L. Chan[1] · Michael L. Talbot[1] · Almino Ramos[1] · Ahmad Bashir[1] · Miguel F. Herrera[1] · Jacques Himpens[1] · Scott Shikora[1] · Kelvin D. Higa[1] · Lilian Kow[1] · Wendy A. Brown[1,2]

Evoluzione delle indicazioni:

2009
LSG controindicata come «primary operation» nei casi di «severe GERD»

2011
l'International Panel non riesca a trovare un consenso unanime riguardo a: «GERD is a relative controindication for LSG» (57%).

2016
BE è controindicazione a LSG

2019
GERD è controindicazione RELATIVA a LSG (e anche BE)

OBESITA' E GERD

GERD post LSG **8 – 76 %**; BE 8 % - 18.8 %

GERD post RYGBP **1.4 - 8 %**; BE 1.5 %

GERD post OAMGB 1**.6 - 11 %**; BE 1.7 %

Tubulo ad alta pressione

Alterazione angolo di His

Disfunzione del LES

Fondo gastrico in eccesso

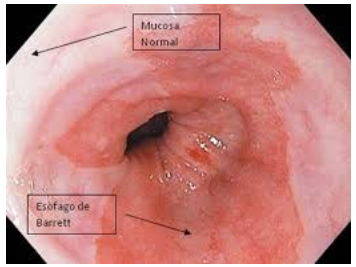
Ernia jatale post operatoria

Persistenza abitudini alimentari scorrette

Alterata motilità gastrica

	POST-SLEEVE
GERD	8 – 76 %
Esofagite	15 – 41 %
Uso di PPI	70 %
Barrett	8 – 18.8 %

Regressione Barrett dopo LRYGBP 0 - 46 %



Chiu S et al. Effect of sleeve gastrectomy on gastroesophageal reflux disease: a sistematic review. Surg Obes Relat Disease 2011;7(4):510-5
Kindel TL et al. The Improvement of Gastroesophageal Reflux Disease and Barrett's after Bariatric Surgery. Obes Surg. 2016 Apr;26(4):718
Howard et al, Surg Obes Relat Dis, 2011; Brandon A, Obes Surg, 2018; Gorodner V, Obes Surg, 2018; Kindel TL et al. Obes Surg. 2016

Gastroesophageal Reflux and Laparoscopic Sleeve Gastrectomy: Results of the First International Consensus Conference

Ahmad Assalia[1] · Michel Gagner[2,3] · Marius Nedelcu[4,5] · Almino C. Ramos[6] · David Nocca[7]

Results Forty-six experts responded (92%). Esophago-gastro-duodenoscopy was considered mandatory before (92%) and after (78%) surgery. No consensus was achieved as to time intervals after surgery and the role of specialized tests for GERD. Higher degrees of erosive esophagitis (94%) and Barrett's esophagus (96%) were viewed as contra-indications for LSG. Roux-en-Y gastric bypass was recommended in postoperative patients with uncontrolled GERD and insufficient (84%) or sufficient (76%) weight loss and Barrett's esophagus (78%). Hiatal hernia (HH) repair was deemed necessary even in asymptomatic patients without GERD (80% for large and 67% for small HH). LSG with fundoplication in patients with GERD was considered by 77.3% of panelists.
Conclusions The importance of pre- and postoperative endoscopy has been emphasized. The role of specialized tests for GERD and the exact surveillance programs need to be further defined. LSG is viewed as contra-indicated in higher degrees of endoscopic and clinical GERD. LSG with anti-reflux fundoplication emerges as a new valid option in patients with GERD.

Per dare corrette indicazioni, è necessario un corretto inquadramento preoperatorio.
Lo studio preoperatorio spesso non è adeguatamente standardizzato
(EGDS, Manometria, pHmetria…)

GERD con i rilasciamenti transitori del LES (trLES) favorito da pressione addominale e gastrica

urgery—IFSO 2020

l F. Herrera[1] ·

SURGERY FOR OBESITY

ELSEVIER

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Mervyn De

[c]Resea

SURGERY FOR OBESITY

ELSEVIER

Third Inte

Michel Gagn

[b]Department of Surgery, I

OBES SURG
DOI 10.1007/s11695-013-1040-

ORIGINAL CONTRIBU

Survey on lapa
at the Fourth I
on Sleeve Gast

Michel Gagner · Mervyn
Ross D. Crosby

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Raul J. Rosenthal, M.D., F.A.C

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Surgery for Obesity and Related Diseases

Original arti

Fifth International Consensus Confe
gastrector

Michel Gagner, M.D., F.R.C.S.C., F.A.C.S., F.A.
Raul Rosenthal, M.D., F.A.C

[a]Herbert Wertheim College of Medicine, Florida In

The Perfect Sleeve Gastrectomy

A Clinical Guide to Evaluation

Almino Ramos Cardoso
Mariano Palermo
Patrick Noel
David Nocca
Editors

Springer EXTRAS ONLINE

Conclusioni

NI

THE PERFECT SLEEVE GASTRECTOMY: ITALIANS DO IT BETTER! (OR NOT?)

Rinforzo della linea di sutura SI

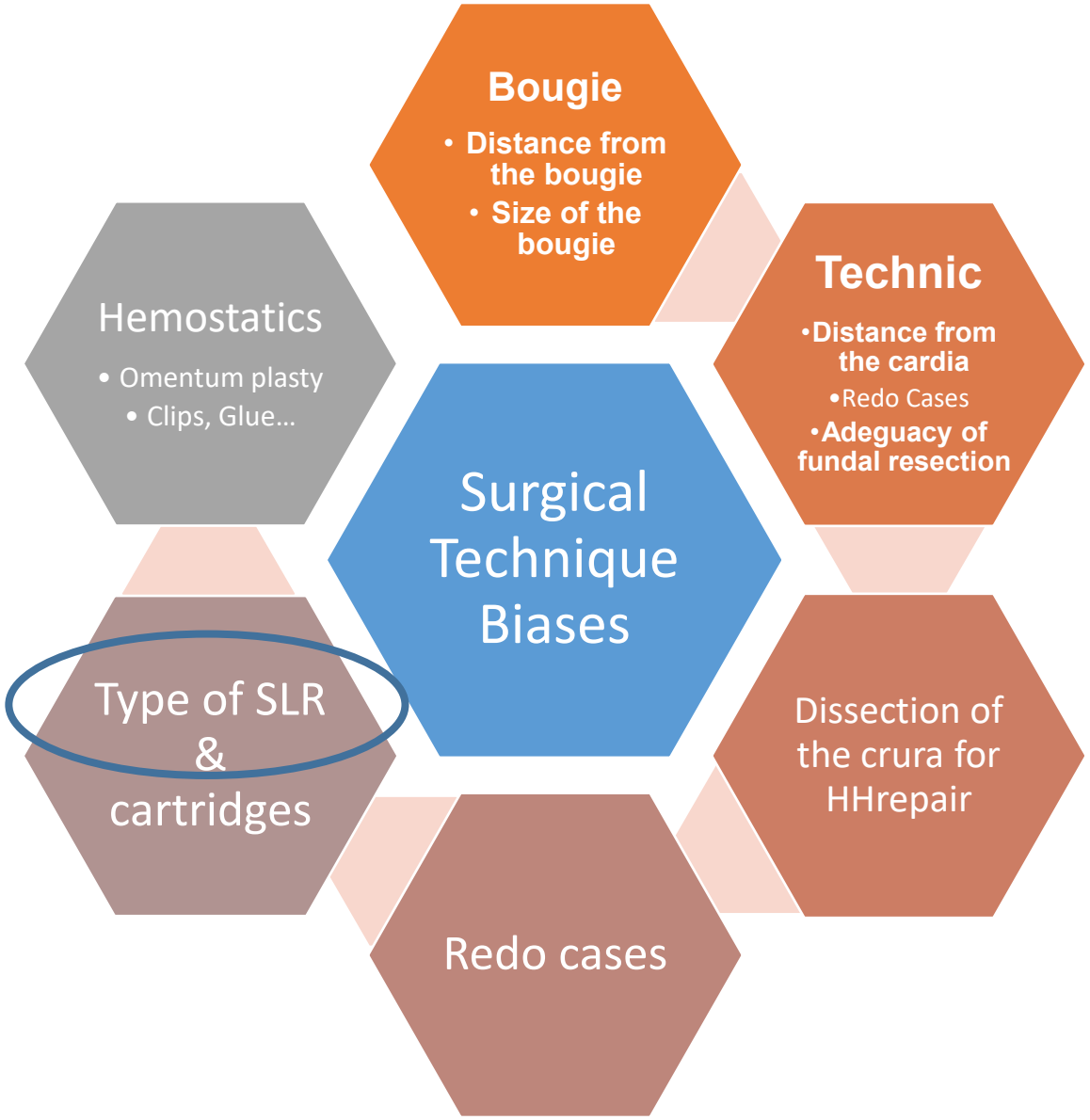
WEBINAR
TERZA
STAGIONE

S.I.C.OB. Società Italiana di Chirurgia dell'OBesità e delle malattie metaboliche

Andrea Peri
Responsabile Chirurgia Bariatrica
Chirurgia Generale 2
Direttore Prof. A.Pietrabissa
IRCCS Policlinico San Matteo, Pavia, Italy

Sopraggitto della staple line?
-Transfisso?
-Introflettente?
-Terzo prossimale?
-Tutta la staple line?

Quale materiale di rinforzo?
-Pericardio bovino? (non assorbibile)
-PGA+TMC ? (lento assorbimento)
-PGA ? (rapido assorbimento)



Challenging Clinical Paper: MBSAQIP

The Impact of Different Surgical Techniques on Outcomes in Laparoscopic Sleeve Gastrectomies

The First Report from the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP)

Elizabeth R Berger, MD,§ Ronald H. Clements, MD, FACS,† John M. Morton, MD, MPH, FACS,‡ Kristopher M. Huffman, MS,§ Bruce M. Wolfe, MD, FACS,|| Ninh T. Nguyen, MD, FACS,¶ Clifford Y. Ko, MD, MS, MSHS, FACS,# and Matthew M. Hutter, MD, MPH, FACS**

Methods: Using the MBSAQIP data registry of 189,477 patients from 720 centers and 1634 surgeons to develop statistical models to analyze outcomes for techniques of sleeve gastrectomy (SG) at patient and surgeon-level. Specific type of staple line reinforcement used was not identified.

Results:

- SLR patients had significantly lower bleeding rates (0.75%) than no SLR (1.00%) and oversewn patients (0.96%)
- SLR cases were associated with higher leak rates (0.96% vs 0.65%) compared to no SLR at the patient level.
- SLR cases were 15 minutes faster than oversewing
- BS ≥ 38Fr was associated with decreased leak rates
- Overall SLR morbidity (4.34%) was lower and statistically significant vs no reinforcement (4.44%) and oversewing (4.67%)

- **Conclusion:** "LSG is a safe and effective weight-loss operation with low bleeding and leak rates. Our data suggest that SLR is associated with an increase in leaks…BS ≥38 Fr tend to be associated with decreased leaks."

Challenging Clinical Paper: MBSAQIP

Letter to the Editor
Fabio Campanile, MD, FACS,
Andosilla Hospital, Civita Castellana, Italy

"It also strikes that the overall leak rate reported by Berger et al on such a broad sample is much lower than in the rest of the literature: Parikh et al's systematic review found it to be 2.2%, Gagner and Buckwald 2.14% (it ranged from 1.1% in patients reinforced with absorbable polymer to 3.3% in those reinforced with bovine pericardium); similar results are generally reported. The same applies for bleeding. This difference is not explained by the authors; underreporting or selective reporting to the registry could account for it. Of course, this is another well-known pitfall of national data collections."

Fabio C. Campanile, MD, FACS

Campanile FC. The impact of different surgical techniques on outcomes in laparoscopic sleeve gastrectomies. The role of a registry based observational study. *Annals of Surgery*. In press.

Sleeve Gastrectomy – Reduced Bleeding

- International Sleeve Gastrectomy Expert Panel meeting resulted in 100% consensus on:

'Staple line reinforcement will reduce bleeding along staple line'

Rosenthal RJ. International Sleeve Gastrectomy Expert Panel Consensus Statement. Best practice guidelines based on experience of over 12,000 cases. *Surgery for Obesity & Related Diseases* 2012;8(1):8-19.

SCIENTIFIC PAPER JSLS

Staple Line Treatment and Bleeding After Laparoscopic Sleeve Gastrectomy

Syed Nabeel Zafar, MBBS, MPH, Jessica Felton, MD, MS, Kaylie Miller, BA, Eric S. Wise, MD, Mark Kligman, MD

October-December 2018 Volume 22 Issue 4 e2018.00056

Sleeve Gastrectomy Meta-Analysis Comparison

Gagner's review

- Reinforcement methods are broken down into 3 groups
  - Bioabsorbable
  - Bovine pericardium
  - Oversewing
- Significantly reduced leaks found with the use of bioabsorbable reinforcement

Other reviews

- Reinforcement methods are all lumped into one group which includes:
- Bioabsorble, bovine pericardium, and oversewing
- No differences found when reinforcement is used

Why the difference?

Not all reinforcements are the same and should be analyzed separately

Staple Line Reinforcement Comparison

A systematic review* of 88 papers representing 8,920 patients found that the leak rate in laparoscopic sleeve gastrectomy (LSG) was significantly lower using bioabsorbable staple line reinforcement than oversewing, bovine pericardium, and no reinforcement.

Leak Rates by Reinforcement

Reinforcement Method	Leaks	# of Patients without Leaks	% Leaks	P-Value Compared to APM[a]
Absorbable Membrane	16	1,446	**1.09**	–
Oversewing (suture)	86	4,128	2.04	0.02
No Reinforcement	67	2,512	2.60	0.001
Bovine Pericardium	22	643	3.30	0.0006
Total	**191**	**8,729**	**2.14**	**–**

[a]Fisher's exact test.

Paper	# of Patients without Leaks	# of Patients with Leak	Leak Rate (%)
Total	**3416**	**23**	**0.67** [2]

Papers published since Gagner Publication[1]

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* Gagner M, Buchwald JN. Comparison of laparoscopic sleeve gastrectomy leak rates in four staple-line reinforcement options: a systematic review. *Surgery for Obesity & Related Diseases* 2014;10(4):713-723.

[2] Gagner M, Brown M. Update on sleeve gastrectomy leak rate with the use of reinforcement. Obesity Surgery 2016; 26(1):146-150.)

So, What are the Numbers?

GORE® SEAMGUARD® Reinforcement papers published in Gagner's meta-analysis

PAPER	# OF PATIENTS WITHOUT LEAKS	# OF PATIENTS WITH LEAK	LEAK RATE (%)
Consten, 2004	10	0	0.00
Moy, 2008	133	2	1.48
Saber, 2008	7	0	0.00
Lewis, 2009	42	0	0.00
Saber, 2009	6	0	0.00
Kockerling, 2009	38	0	0.00
Gentileschi, 2010	8	0	0.00
Chowbey, 2010	75	0	0.00
Diamantis, 2010	25	0	0.00
Jacobs, 2010	155	2	1.27
Dapri, 2010	23	2	8.00
Nath, 2010	99	1	1.00
Simon, 2011	57	2	3.39
Ayloo, 2011	69	0	0.00
Gluck, 2011	204	0	0.00
Diamantis, 2011	19	0	0.00
Zhang, 2011	45	0	0.00
Slater, 2011	164	1	0.61
Nguyen, 2012	50	0	0.00
Chopra, 2012	170	4	2.30
Albanopoulos, 2012	46	2	4.17
Sub-total	**1445**	**16**	**1.10**

So, What are the Numbers?

GORE® SEAMGUARD® Reinforcement papers published in Gagner's meta-analysis

PAPER	# OF PATIENTS WITHOUT LEAKS	# OF PATIENTS WITH LEAK	LEAK RATE (%)
Gentileschi, 2012	40	0	0.00
Dey, 2013	50	0	0.00
Eisenberg, 2013	70	1	1.41
Durmush, 2014	332	0	0.00
D'Ugo, 2014	61	2	3.17
Pham, 2014	23	0	0.00
Noel, 2014	10	0	0.00
Elli, 2014	408	1	0.24
Gomberawalla, 2014	72	0	0.00
Schraibman, 2014	48	0	0.00
Barreto, 2015	857	3	0.35
Sub-total	**1971**	**7**	**0.35**
Total	**3416**	**23**	**0.67**

Average leak rate for all papers published on GORE® SEAMGUARD® Reinforcement for use in sleeve gastrectomies is 0.67%.

Staple Line Reinforcement Comparison

A systematic review of 148 papers representing 40,623 patients found that the leak rate in laparoscopic sleeve gastrectomy (LSG) was significantly lower using bioabsorbable staple line reinforcement than oversewing, bovine pericardium, and no reinforcement.

Leak rate 0,7% p<0,007

Surgical Endoscopy (2020) 34:396–407
https://doi.org/10.1007/s00464-019-06782-2

Check for updates

Comparison of laparoscopic sleeve gastrectomy leak rates in five staple-line reinforcement options: a systematic review

Michel Gagner[1,2,3] · Paul Kemmeter[4]

Received: 10 December 2018 / Accepted: 4 April 2019 / Published online: 16 April 2019
© The Author(s) 2019

Material Matters

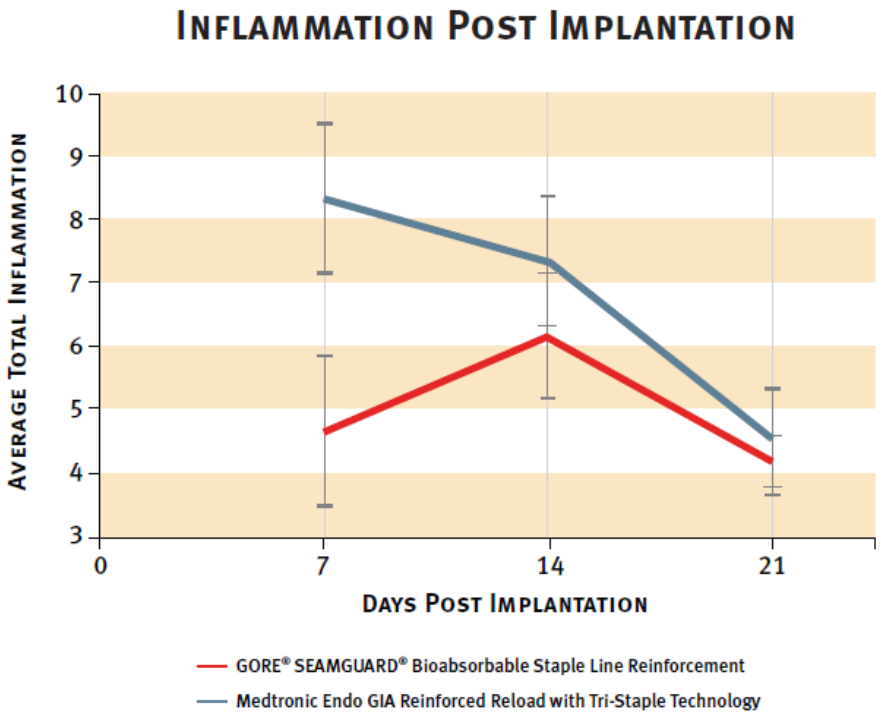
- Innovative material science is at the core of every product we engineer at Gore.
- Gore's bioabsorbable material technology is backed by more than 20 years of research and clinical use.
- Gore's bioabsorbable staple line reinforcement is constructed from PGA / TMC, which has an open, highly interconnected pore structure that facilitates cell infiltration and growth.
- PGA / TMC absorbs within six to seven months, which is about twice as long as PGA alone.

PGA / TMC ≠ PGA

Inflammatory Response

A significantly higher inflammatory response was observed for Medtronic Endo GIA Reinforced Reload with Tri-Staple Technology devices compared to GORE® SEAMGUARD® Bioabsorbable Staple Line Reinforcement at early post-operative time-points.*

This was quantified by counting the acute inflammatory cells in 5 fields per section (10 fields per device) under 40x magnification. Inflammation was quantified using a modified International Organization for Standardization 10993-6:2009 / American Society for Testing and Materials (ISO / ASTM) scoring scale.

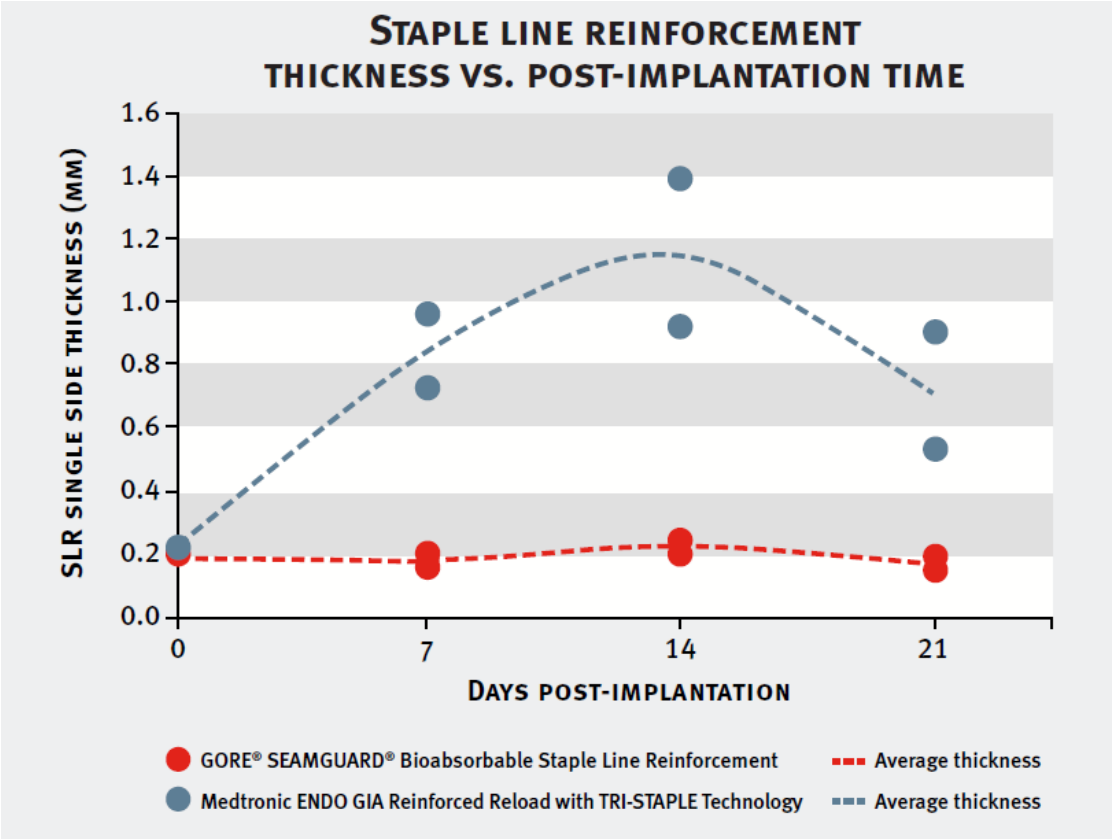


At Day 7 the Medtronic Endo GIA Reinforced Reload with Tri-Staple Technology had a significantly greater inflammatory response than GORE® SEAMGUARD® Bioabsorbable Staple Line Reinforcement.

At Days 14 and 21, while there was a trend of higher inflammation in the Medtronic Endo GIA Reinforced Reload with Tri-Staple Technology group compared to the GORE® SEAMGUARD® Bioabsorbable Staple Line Reinforcement group, this was not significantly different.

Material thickness

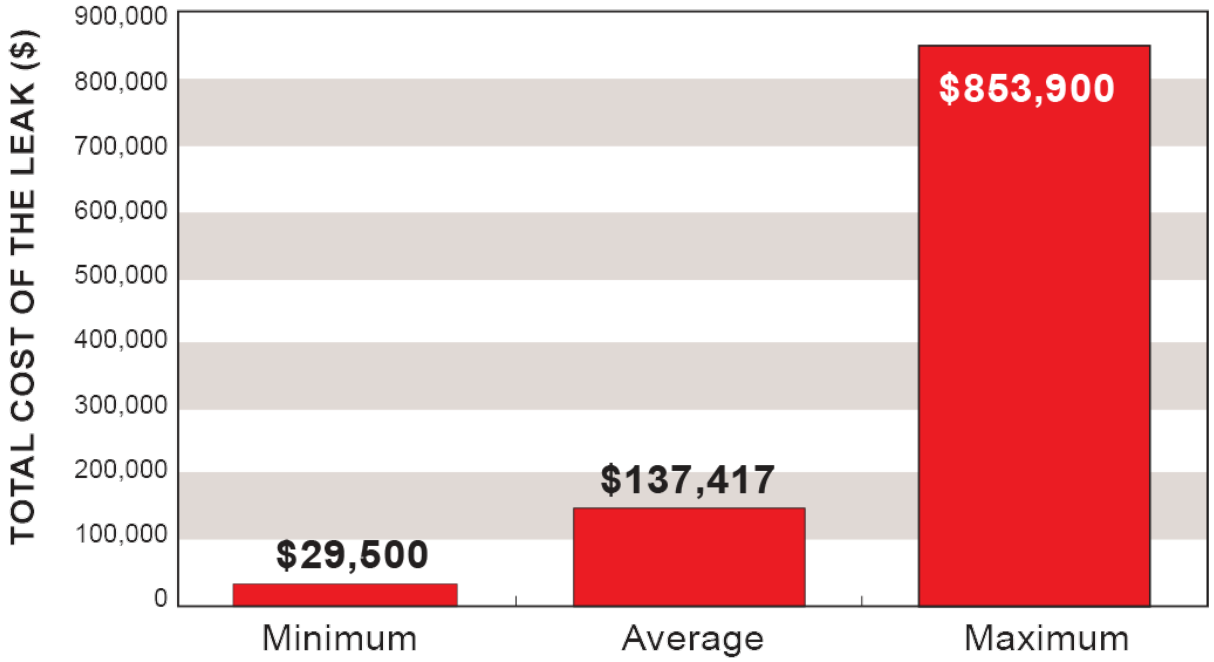
A major observation in this study was the variation in the thickness of the device materialafter implantation, where some **Medtronic ENDO GIA Reinforced Reload with TRI-STAPLE Technology devices increased to more than 500% of the original device thickness.**



- **Medtronic ENDO GIA Reinforced Reload with TRI-STAPLE Technology material thickness increased 2x–6x,** going from 0.22 mm pre-implantation, to 0.73–0.96 mm at Day 7, 0.92–1.39 mm at Day 14, and 0.54–0.91 mm at Day 21.
- **GORE® SEAMGUARD® Bioabsorbable Staple Line Reinforcement maintained a consistent thickness over 21 days, with minimal variation from the nominal thickness** of 0.2 mm (0.18 mm at Day 7, 0.22–0.24 mm at Day 14, and 0.18 mm at Day 21).

Why Do Leaks Matter So Much?
Financial Cost of Treating Post-Operative Leaks

Cost of Treating a Leak – Post-Sleeve Gastrectomy



Bour ES, *et al*. Total Charges for Post-Operative Leak Following Laparoscopic Sleeve Gastrectomy. Presented at Obesity Week 2013; November 11-16; Atlanta, GA

Potential Cost Savings with GORE® SEAMGUARD® Reinforcement

GORE® SEAMGUARD® Reinforcement	**Reinforcement with Unknown Data**
100 Sleeve Cases	100 Sleeve Cases
x 1% Leak Rate	x 2% Leak Rate
1 leak	*2 leaks*
x $137,417 / leak	x $137,417 / leak
$137,417	**$274,834**

Bour ES, *et al*. Total Charges for Post-Operative Leak Following Laparoscopic Sleeve Gastrectomy. Presented at Obesity Week 2013; November 11-16; Atlanta, GA

Conclusioni

La nostra esperienza (500casi):

Leak rate: 0.6%*
Staple line bleeding: 1%

* n.3 chirurghi in curva di apprendimento

In assenza di problematiche relative al costo… chi non userebbe una membrana polimerica riassorbibile?

The Perfect Sleeve Gastrectomy: Italians Do It Better (or Not?)

S.I.C.OB.

Conversione da SG a OAGB

Maurizio De Luca
Director Department of General Surgery
Rovigo Hospital – Italy
Vice President Italian Society of Bariatric Surgery and Metabolic Disease
Treasurer IFSO EC
Board Member SIO

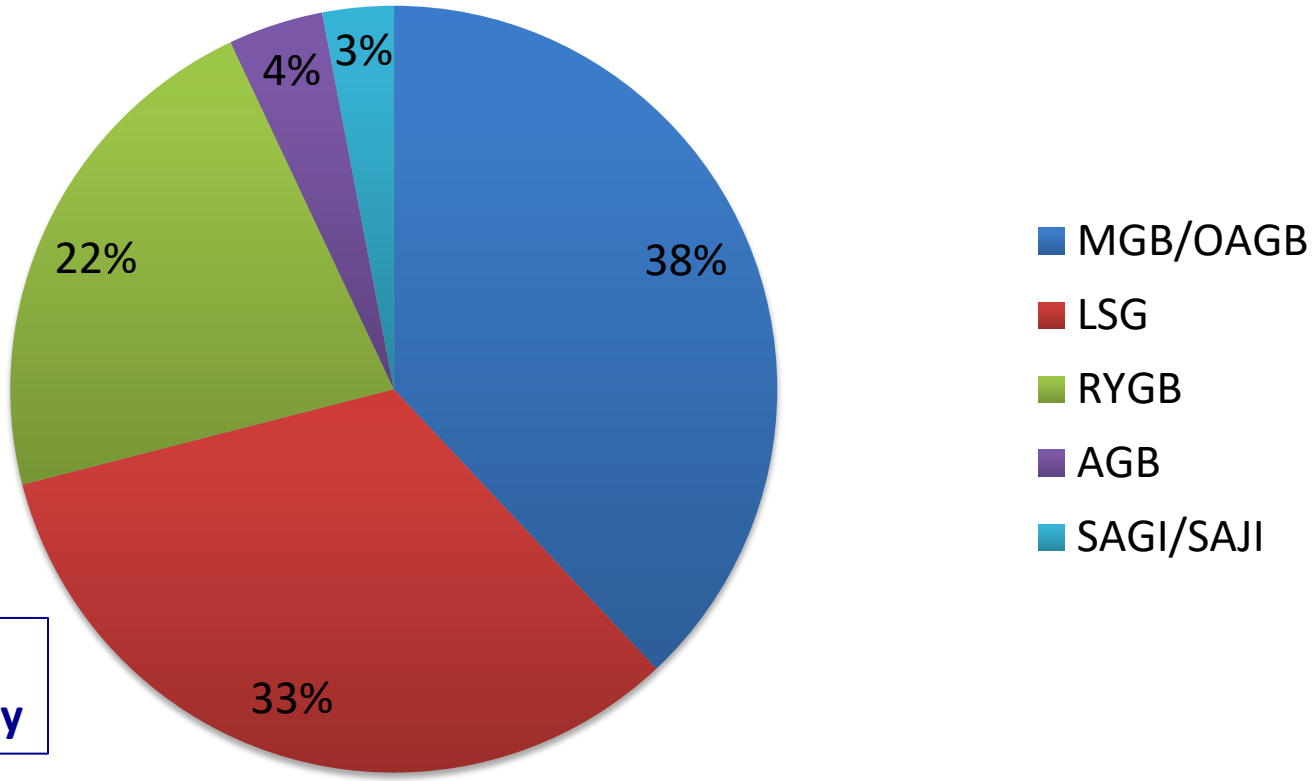
Webinar SICOB 3° Stagione; 4° Appuntamento 27 Aprile 2021

The Perfect Sleeve Gastrectomy

Conversione da Sleeve a OAGB

S.I.C.OB.

Case Mix Disclosure



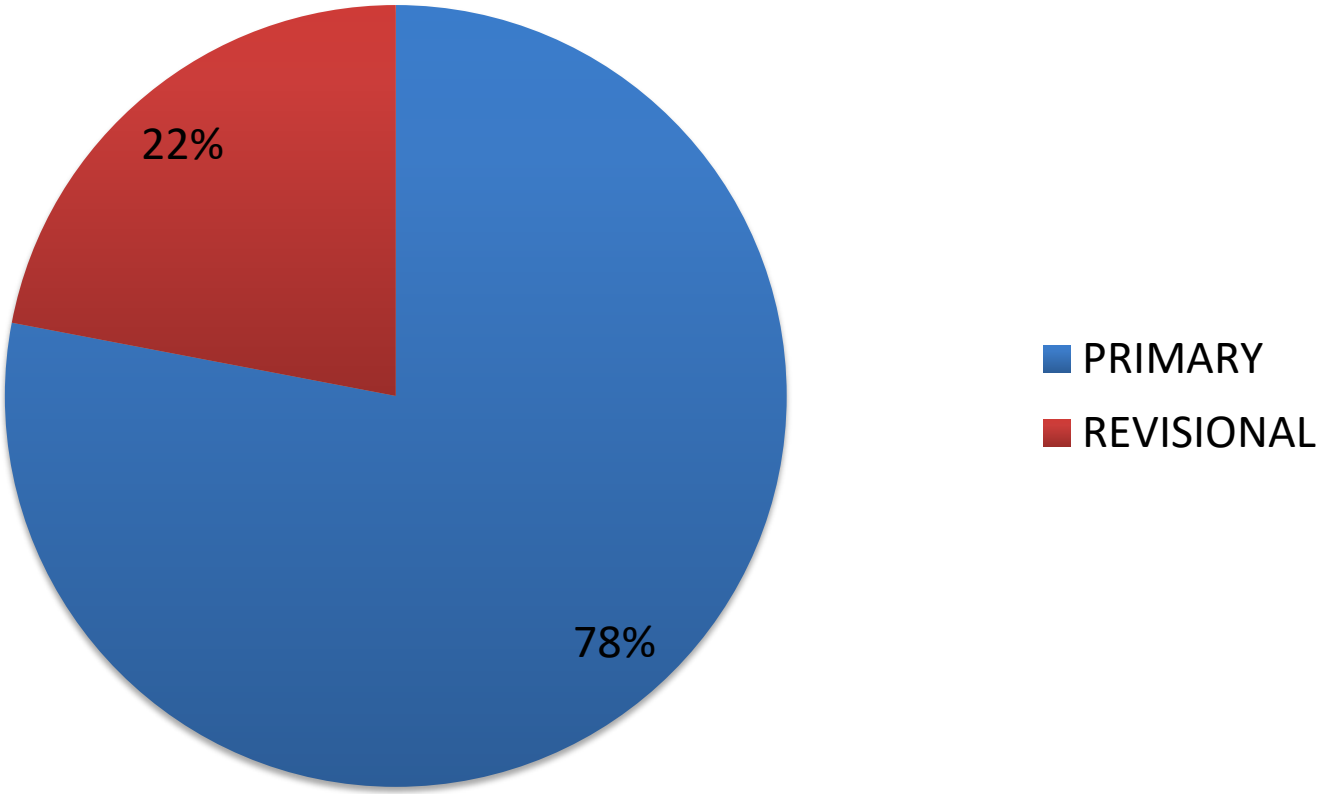
Maurizio De Luca
Last 5 years activity

The Perfect Sleeve Gastrectomy

Conversione da Sleeve a OAGB

S.I.C.OB.

Case Mix Disclosure



Maurizio De Luca
2019 activity

The Perfect Sleeve Gastrectomy

Conversione da Sleeve a OAGB

S.I.C.OB.

Reinterventi effettuati per **due principali motivi**:

1) risolvere complicanze o effetti collaterali legati al primo intervento

2) migliorare i risultati in termini di calo ponderale insufficiente, inadeguato controllo delle comorbidità, re-incremento ponderale

Il termine ***chirurgia di revisione*** andrebbe riservato a questo secondo gruppo

EAES, IFSO-EC, EASO 2020 Guidelines

S.I.C.OB.

Failure or non-responders?

- Obesità = ***patologia cronica*** che richiede un trattamento a vita
- Il concetto di ***fallimento terapeutico*** si adatta male al trattamento di una patologia cronica
- Il termine ***pazienti non responders*** si adatterebbe meglio al concetto di mancato raggiungimento degli obiettivi/ricaduta
- ***Primary e secondary*** non responders

EAES, IFSO-EC, EASO 2020 Guidelines

S.I.C.OB.

Primary non responders

- Riconoscimento **precoce** dell'inadeguato calo ponderale, per permettere un approccio multimodale (modifiche intensive dello stile di vita, terapia cognitivo-comportamentale, terapia farmacologica)

- Valutazione di chirurgia di revisione dopo 18-24 mesi (nadir)

EAES, IFSO-EC, EASO 2020 Guidelines

Primary non responders

- Calo ponderale inferiore al 10% del peso basale
- Calo ponderale insufficiente a spostare il paziente fuori dalla classe di obesità che lo ha reso candidabile all'intervento
- Calo ponderale insufficiente a permettere un controllo adeguato delle comorbidità, incluso il T2DM.

EAES, IFSO-EC, EASO 2020 Guidelines

S.I.C.OB.

Secondary non responders

- **Reincremento** ponderale dopo un iniziale successo del trattamento
- Va considerato dopo circa **24 mesi** dal primo intervento, periodo dopo il quali gli effetti della procedura bariatrica/metabolica si sono "stabilizzati"
- Incremento ponderale progressivo superiore al 20-25% del peso totale perso
- Incremento ponderale sufficiente a reinserire il paziente nella classe di obesità che lo ha reso candidabile all'intervento
- Incremento ponderale associato ad inadeguato controllo delle comorbidità

EAES, IFSO-EC, EASO 2020 Guidelines

The Perfect Sleeve Gastrectomy

Conversione da Sleeve a OAGB

S.I.C.OB.

Azioni cognitivo-comportamentali, alimentari, farmacologiche e chirurgiche su primary e secondary non responders

- Solo il 10% dei pazienti viene **informato** circa la possibilità del fallimento dell'intervento chirurgico
- Frequente sottostima dei disturbi del comportamento alimentare (**DCA**) o psichici
- Frequente inadeguata informazione circa il ruolo della chirurgia e l'importanza della **compliance** (per esempio drop out al follow up)

- Velapati SR et al. *Weight Regain After Bariatric Surgery: Prevalence, Etiology, and Treatment.* Curr Nutr Rep. 2018 Dec; 7(4):329-334

The Perfect Sleeve Gastrectomy

Conversione da Sleeve a OAGB

S.I.C.OB.

Azioni cognitivo-comportamentali, alimentari, farmacologiche e chirurgiche su primary e secondary non responders

- Per ciascun paziente non responsivo, la prima cosa da fare è escludere una significativa alterazione anatomica (es. tubulo largo dopo sleeve, tasca gastrica grande dopo RYGB, dilatazione esofago-gastrica di un bendaggio etc)

- Qualora escluse, il paziente va sottoposto a **rivalutazione psicologica-psichiatrica**

EAES, IFSO-EC, EASO 2020 Guidelines

The Perfect Sleeve Gastrectomy

Conversione da Sleeve a OAGB

S.I.C.OB.

Surgical Endoscopy
https://doi.org/10.1007/s00464-019-06937-1

Check for updates

The first consensus statement on revisional bariatric surgery using a modified Delphi approach

Kamal K. Mahawar[1] · Jacques M. Himpens[2] · Scott A. Shikora[3] · Almino C. Ramos[4] · Antonio Torres[5] · Shaw Somers[6] · Bruno Dillemans[7] · Luigi Angrisani[8] · Jan Willem M. Greve[9,10] · Jean-Marc Chevallier[11] · Pradeep Chowbey[12] · Maurizio De Luca[13] · Rudolf Weiner[14] · Gerhard Prager[15] · Ramon Vilallonga[16] · Marco Adamo[17] · Nasser Sakran[18] · Lilian Kow[19] · Mufazzal Lakdawala[20] · Jerome Dargent[21] · Abdelrahman Nimeri[22] · Peter K. Small[1]

Received: 23 January 2019 / Accepted: 12 June 2019
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The Perfect Sleeve Gastrectomy

Conversione da Sleeve a OAGB

S.I.C.OB.

- **Conversione**: procedura chirurgica diversa dalla precedente
- **Correzione:** modifica delle precedente procedura
- **Restaurazione:** ripristino della condizione pre-intervento (può essere anatomica o funzionale)

ASMBS Revision Task Force, 2014

S.I.C.OB.

NON RESPONDERS DOPO SLEEVE GASTRECTOMY

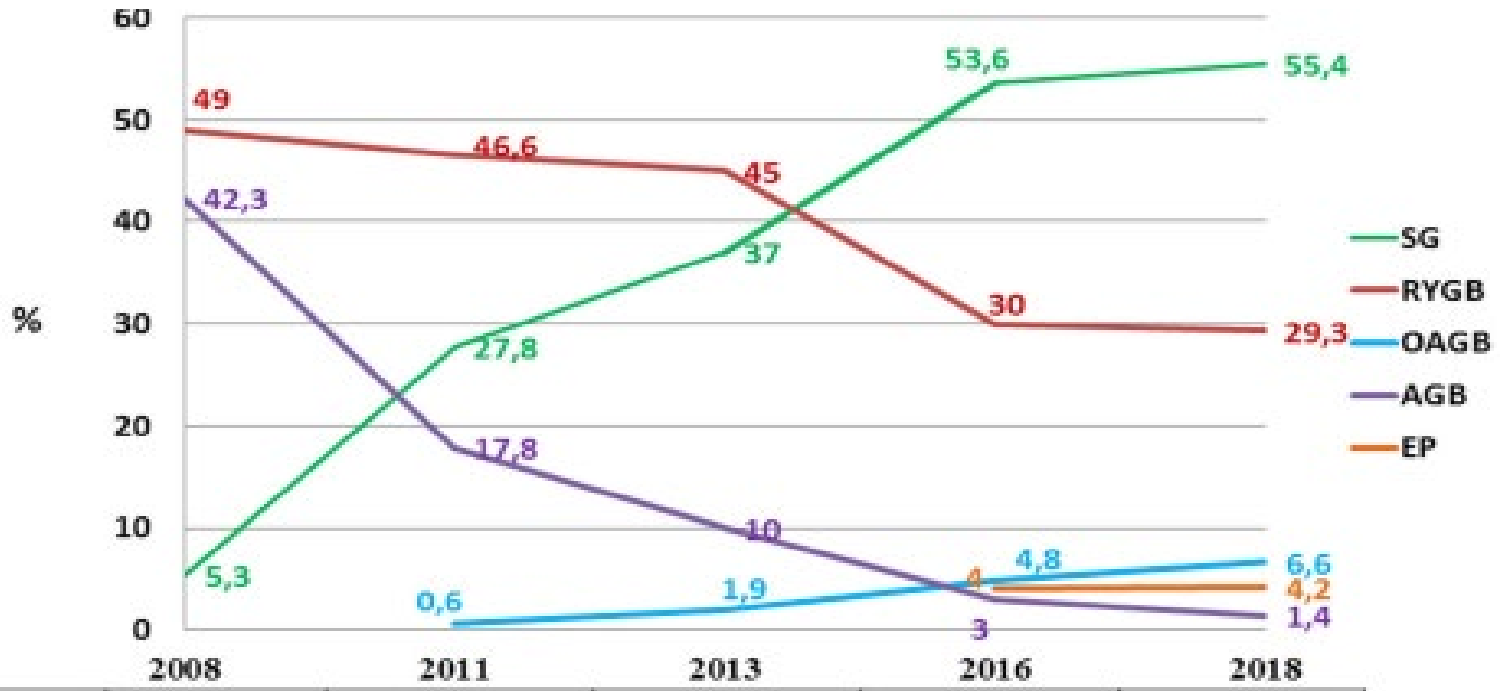
- Attualmente la procedura di chirurgia bariatrica **più eseguita** nel mondo
- Incidenza di fallimento attualmente fino al 30% a 5 anni
- Pochi i lavori su casistiche a lungo termine

EAES, IFSO-EC, EASO 2020 Guidelines

The Perfect Sleeve Gastrectomy

Conversione da Sleeve a OAGB

S.I.C.OB.



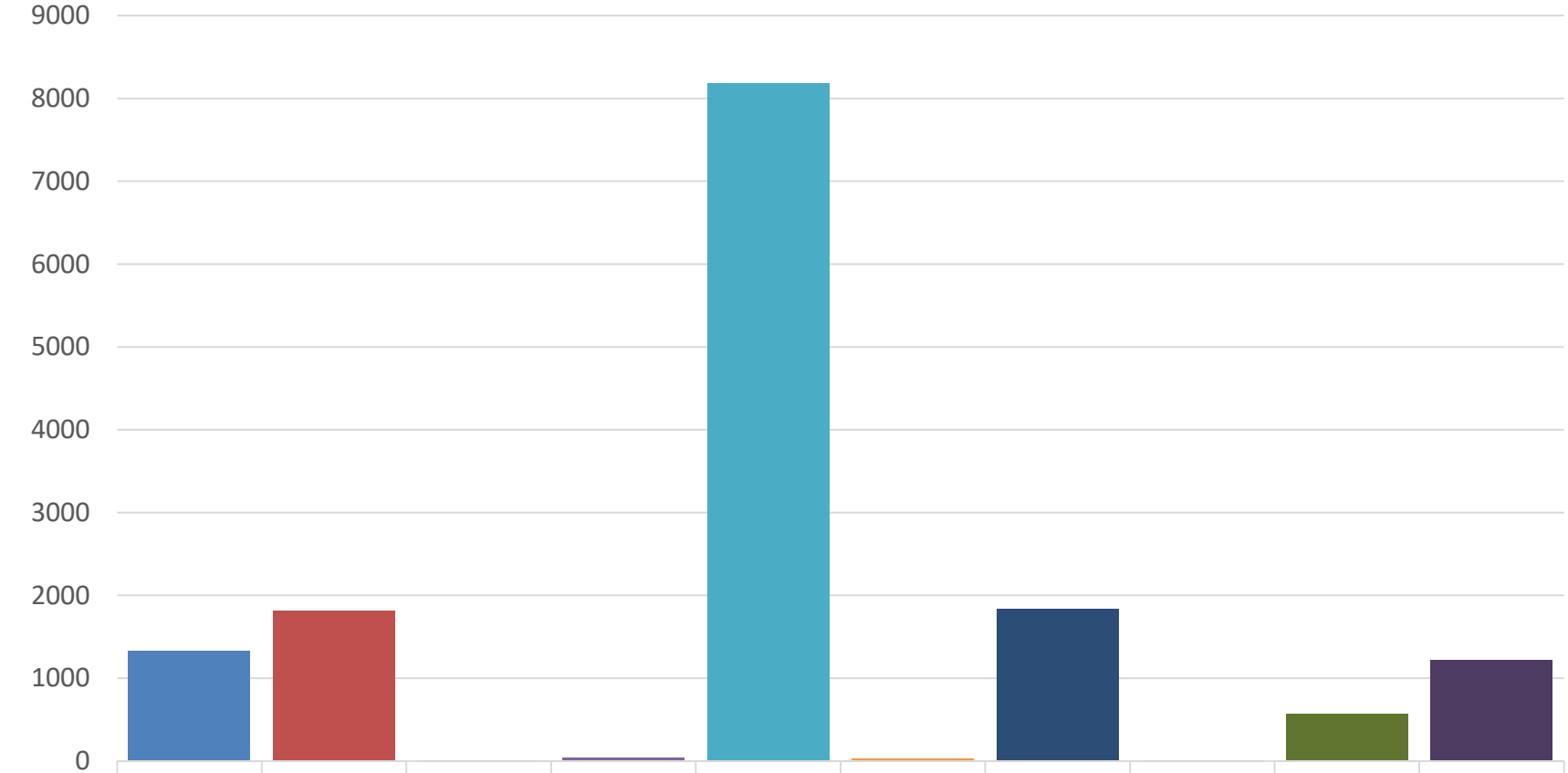
Bariatric procedures (N)	344,221	340,768	468,609	685,874	696,191

Bariatric Surgery Survey 2018: Similarities and Disparities Among the 5 IFSO Chapters
Luigi Angrisani, Antonella Santonicola, Paola Iovino, Almino Ramos, Scott Shikora & Lilian Kow
Obesity Surgery, 2021, 31, 1937-1948

S.I.C.OB.

Tipologia delle procedure eseguite nel **2020**

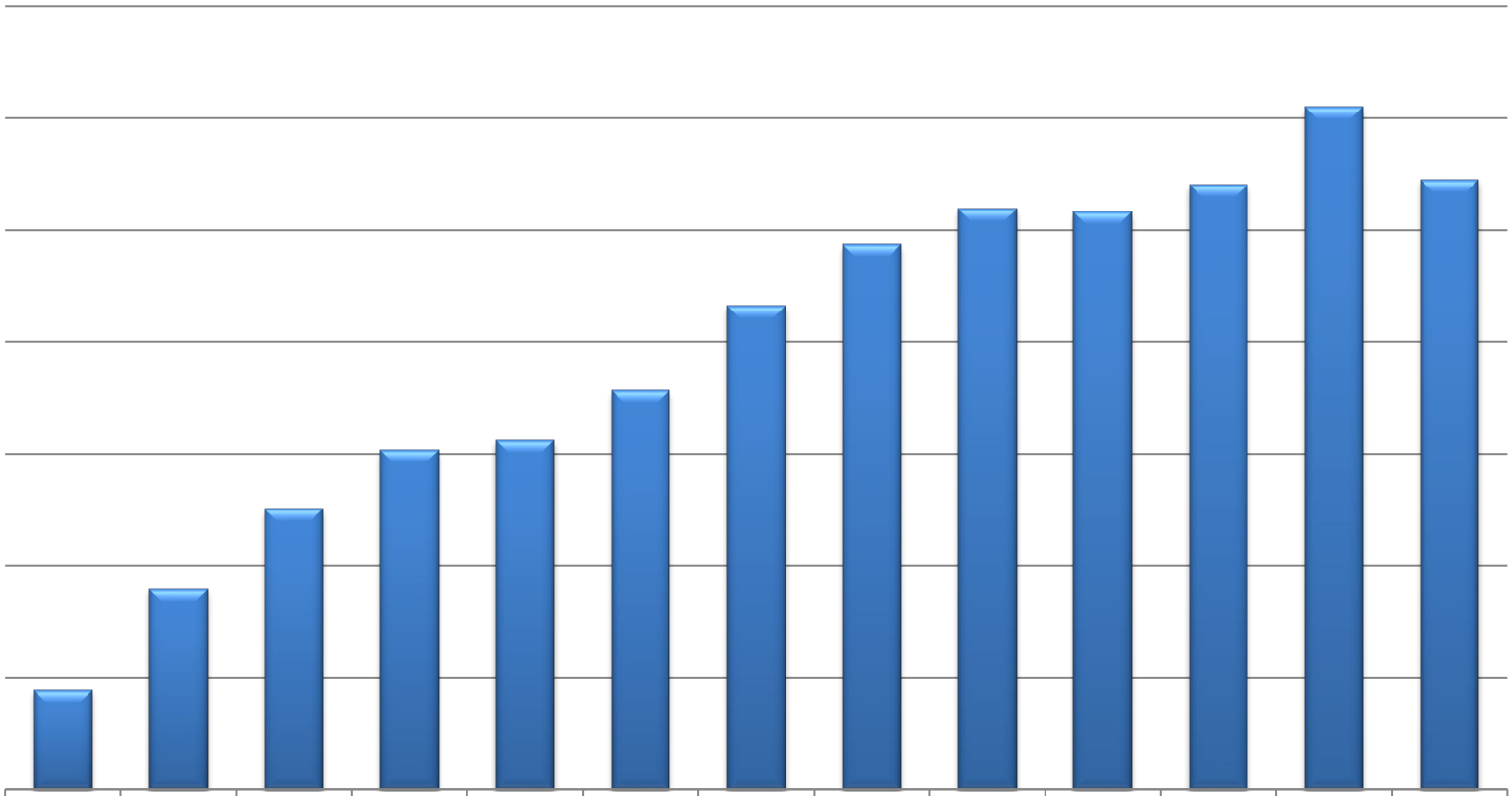
Totale **15.014** interventi



	Bendaggio Gastrico	Bypass gastrico	Diversione Sec. Scopinaro	Duodenal Switch	Sleeve Gastrectomy	Plicatura	Mini Gastric Bypass	Gastroplastica verticale	Altre procedure	Procedure endoscopiche
Serie1	1325	1814	9	33	8178	27	1827	9	571	1221

S.I.C.OB.

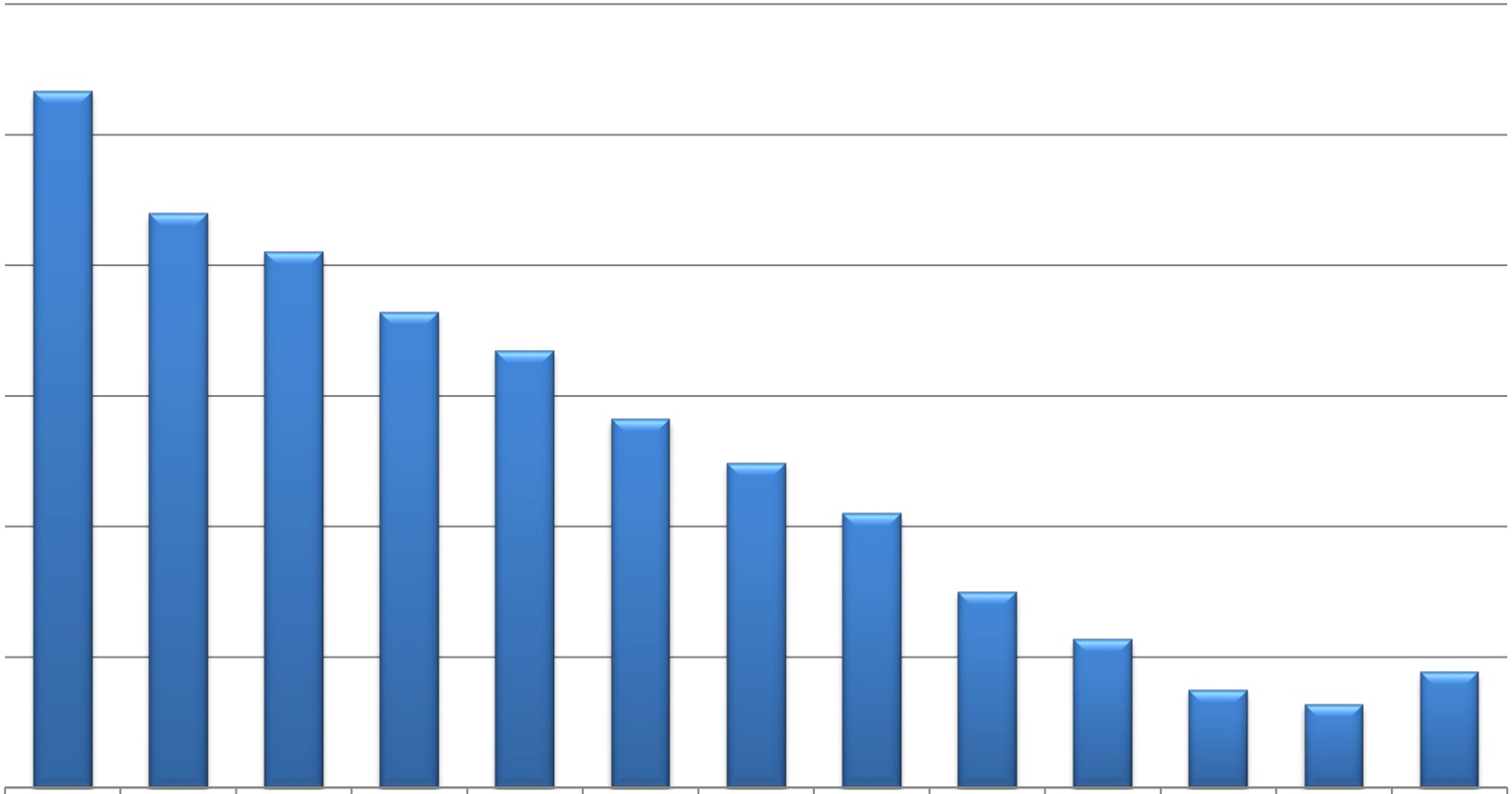
Sleeve Gastrectomy Andamento Percentuale sul totale interventi



	Casistica 2008	Casistica 2009	Casistica 2010	Casistica 2011	Casistica 2012	Casistica 2013	Casistica 2014	Casistica 2015	Casistica 2016	Casistica 2017	Casistica 2018	Casistica 2019	Casistica 2020
Sleeve gastrectomy percentuale	9%	18%	25%	30%	31%	36%	43%	49%	52%	52%	54%	61%	54%

S.I.C.OB.

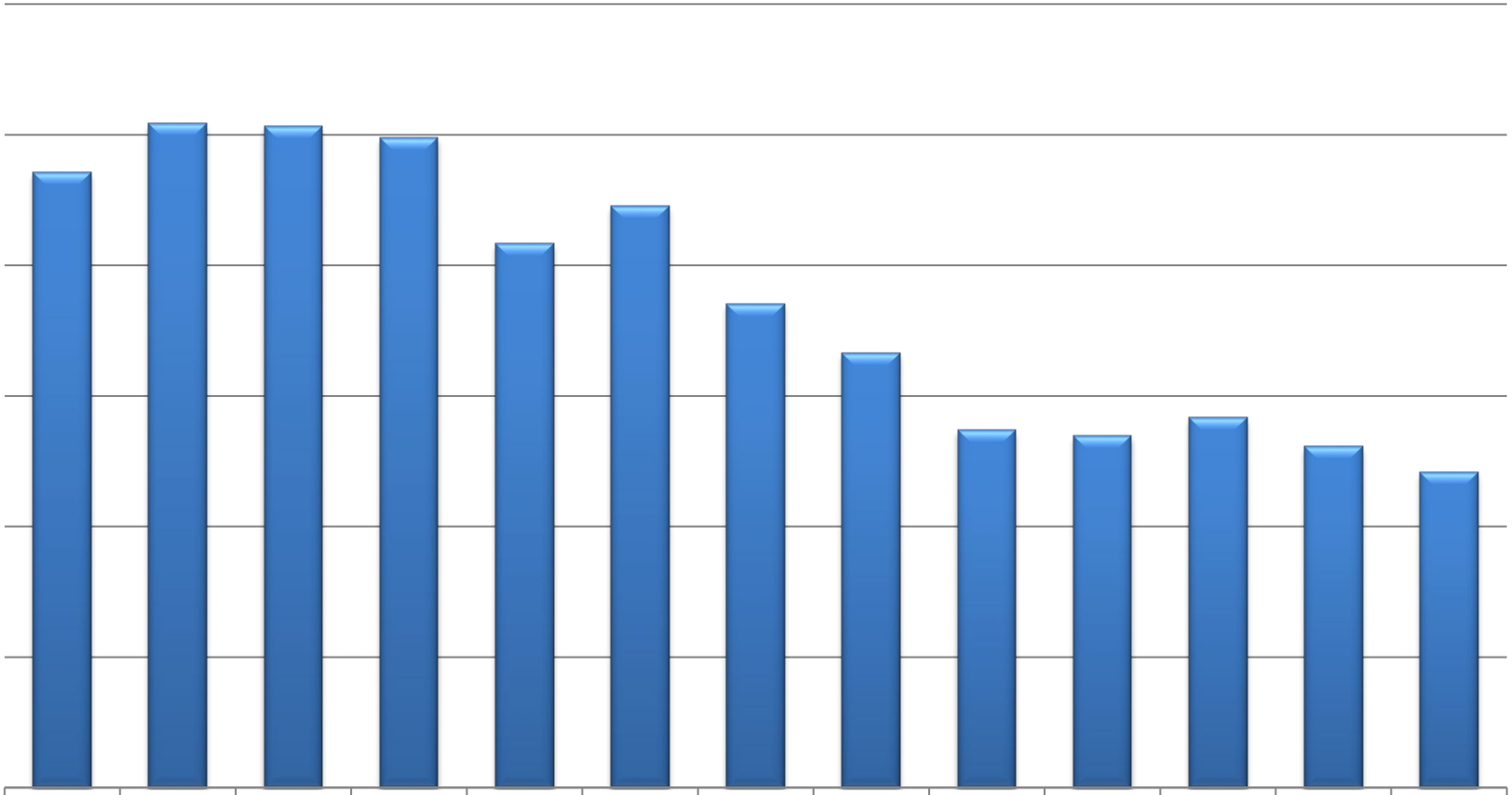
Bendaggio Gastrico Andamento Percentuale sul totale interventi



	Casistica 2008	Casistica 2009	Casistica 2010	Casistica 2011	Casistica 2012	Casistica 2013	Casistica 2014	Casistica 2015	Casistica 2016	Casistica 2017	Casistica 2018	Casistica 2019	Casistica 2020
Bendaggio gastrico	53%	44%	41%	36%	33%	28%	25%	21%	15%	11%	7%	6%	9%

S.I.C.OB.

RYGB Andamento Percentuale sul totale interventi



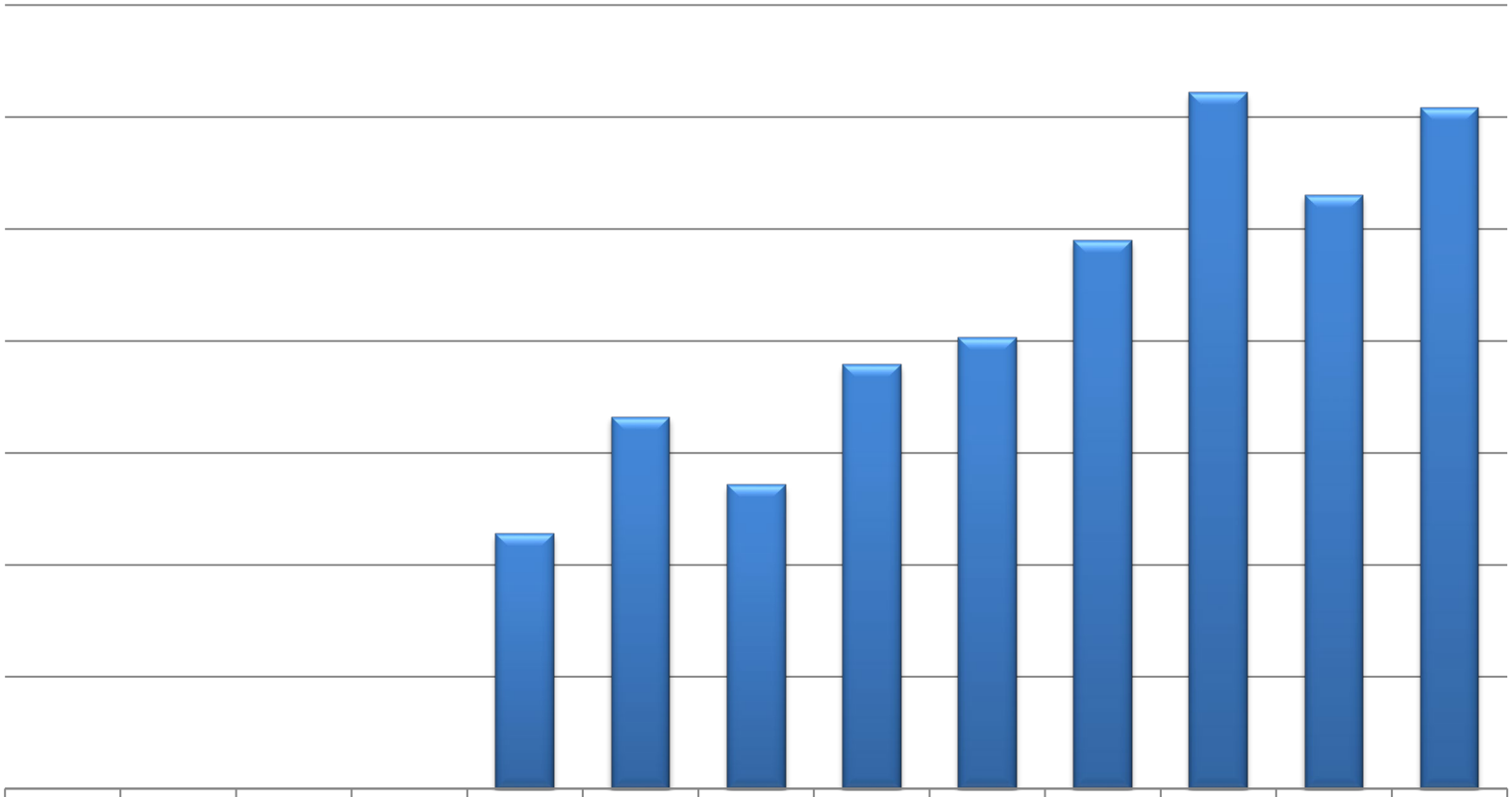
	Casistica 2008	Casistica 2009	Casistica 2010	Casistica 2011	Casistica 2012	Casistica 2013	Casistica 2014	Casistica 2015	Casistica 2016	Casistica 2017	Casistica 2018	Casistica 2019	Casistica 2020
By pass gastrico	24%	25%	25%	25%	21%	22%	19%	17%	14%	13%	14%	13%	12%

The Perfect Sleeve Gastrectomy

Conversione da Sleeve a OAGB

S.I.C.OB.

OAGB Andamento Percentuale sul totale interventi



	Casistica 2008	Casistica 2009	Casistica 2010	Casistica 2011	Casistica 2012	Casistica 2013	Casistica 2014	Casistica 2015	Casistica 2016	Casistica 2017	Casistica 2018	Casistica 2019	Casistica 2020
OAGB	0%	0%	0%	0%	5%	7%	5%	8%	8%	10%	12%	11%	12%

S.I.C.OB.

NON RESPONDERS DOPO SLEEVE GASTRECTOMY

Possibili **cause**:

1. Dilatazione dello stomaco residuo (primary or secondary)

2. Fattori **psicologici/psichiatrici** (pazienti scarsamente studiati pre-operatoriamente)

3. GERD: va considerato come fallimento nella misura in cui diventa invalidante per la qualità di vita (QoL) del paziente

EAES, IFSO-EC, EASO 2020 Guidelines

S.I.C.OB.

NON RESPONDERS DOPO SLEEVE GASTRECTOMY

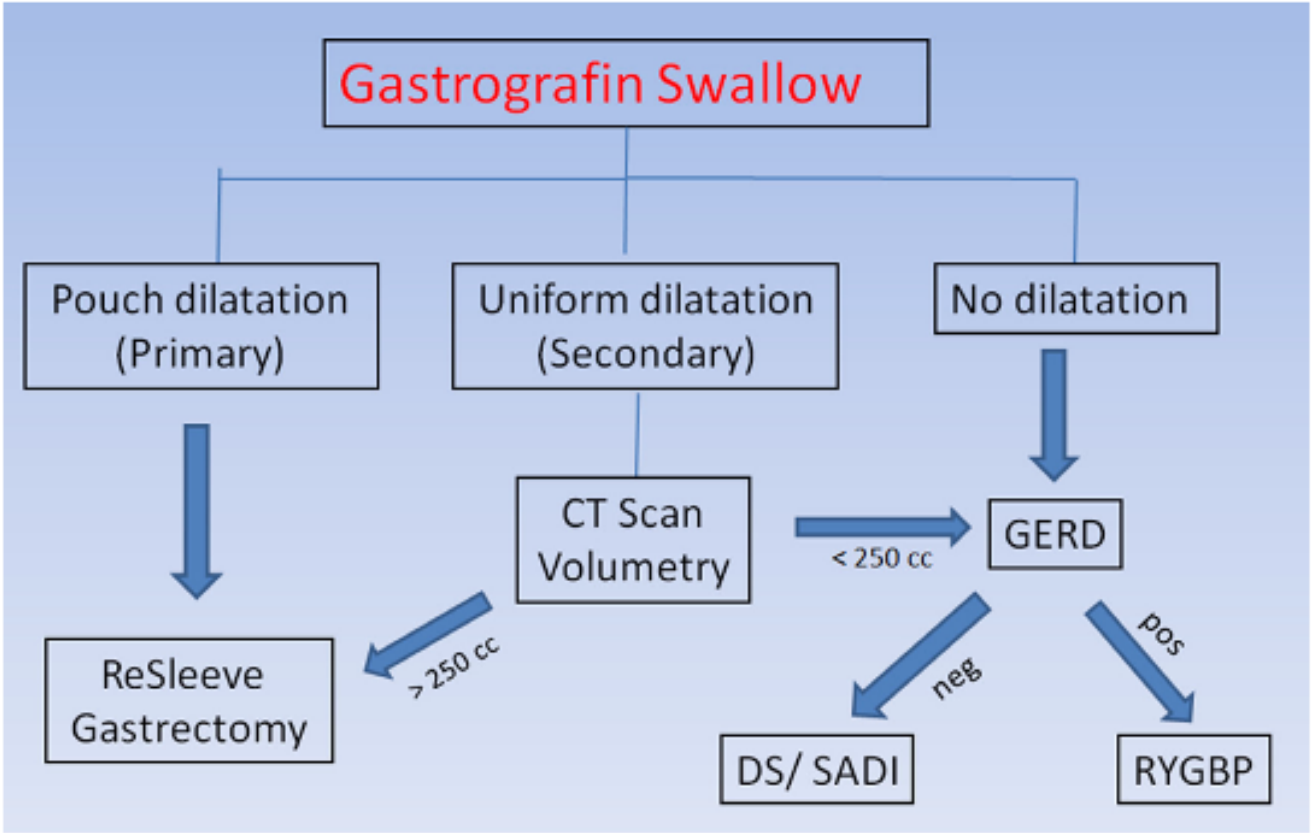
- Fondamentale adeguato work-up **preoperatorio** (EGDS + RXTD per studio del reflusso)
- Fondamentale stretta adesione alla **tecnica chirurgica** standardizzata (reperi anatomici, Buogie size etc)

- J. Homan et al. *Secondary surgery after sleeve gastrectomy: Roux-en-Y gastric bypass or biliopancreatic diversion with duodenal switch.* SOARD 2014.

The Perfect Sleeve Gastrectomy

Conversione da Sleeve a OAGB

S.I.C.OB.



Original article

Revised sleeve gastrectomy (re-sleeve)

Marius Nedelcu, M.D.[a,b,*], Patrick Noel, M.D.[a], Antonio Iannelli[c], Michel Gagner, M.D., F.R.C.S.C., F.A.C.S., F.A.S.M.B.S.[d]

NON RESPONDERS DOPO SLEEVE GASTRECTOMY

- Se dilatazione del tubulo: re-sleeve, RYGB, OAGB, DBP-DS, SADI-S, plicatura endoscopica
- Se fondo gastrico residuo: fundectomia, plicatura endoscopica
- Se GERD invalidante: RYGB
- Se mancato controllo T2DM: RYGB, OAGB

- P. Noel, M. Nedelcu et al. *Revised sleeve gastrectomy: another option for weight loss failure after sleeve gastrectomy*. Surg Endosc (2014) 28:1096–1102.
- Moon RC et al. *Conversions After Sleeve Gastrectomy for Weight Regain: to Single and Double Anastomosis Duodenal Switch and Gastric Bypass at a Single Institution*. Obes Surg. 2018 Sep 24.

The Perfect Sleeve Gastrectomy

Conversione da Sleeve a OAGB

S.I.C.OB.

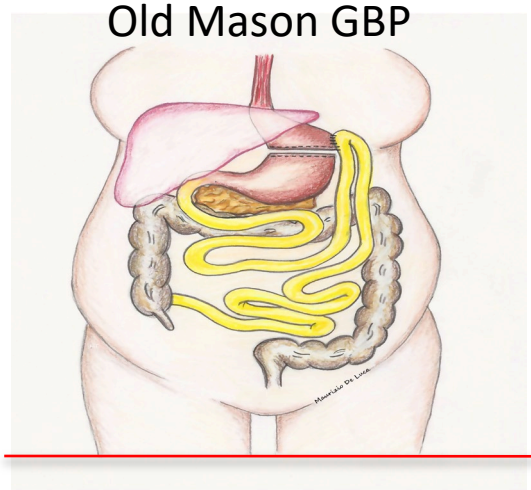
The **OAGB** combines two major components:

1) First is a long **non-obstrutive gastric tube** (Collis Gastroplasty), sized equal to the diameter of the esophagus that rapidly delivers undigested food through the **non-obstructive wide gastro-jejunostomy** into the distal jejunum. This results in an exaggerated "**Post-Gastrectomy Syndrome (PGS)**" that restricts the intake of food (without "obstruction"), limits the intake of sugars, fat and large food boluses, but allows each of these in moderation.

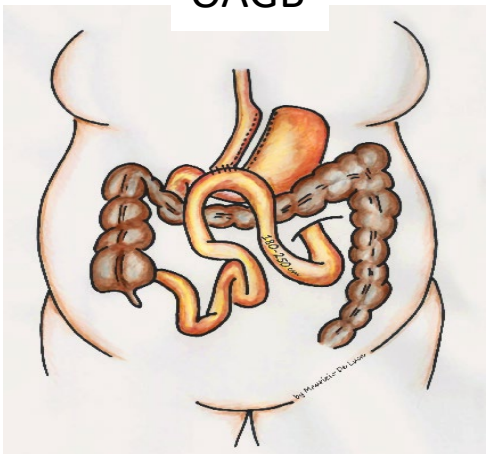
1) The PGS results in alteraion of intestinal transit time, reduced acid secretion, bloating, decreased appetite, and consequently decreased caloric intake.

1) The other component of the OAGB is a **moderate malabsorption** due to the bilio-pancreatic limb (150 - 250 cm) combined with a Billroth II gastro-jejunostomy that results in significantly more fat malabsorption and fatty food intolerance then RNY.

Old Mason GBP



OAGB



MILLS JD. The post-gastrectomy syndrome.
Can Med Assoc J. 1953 Sep;69(3):237-42

Eagon JC1, Miedema BW, Kelly KA., Postgastrectomy syndromes.
Surg Clin North Am.1992 Apr;72(2):445-65.

De Luca M et al, *Mini Gastric Bypass-One Anastomosis Gastric Bypass (MGB-OAGB)-IFSO Position Statement,*
Obes Surg. 2018 May;28(5):1188-1206.

Maurizio De Luca

Background

- **MGB** consists of a lesser curvature-based long-sleeved gastric pouch starting 2–3 cm below the level of the crow's foot and extending proximally slightly to the left of the angle of His. An antecolic 3–5 cm wide anastomosis is then constructed between the pouch and the jejunum, about 180–220 cm distal to Treitz' ligament. In the super obese, the distance to Treitz' ligament would be about 250 cm, in the elderly or vegetarians 180–200 cm and in type II diabetics without major obesity about 150 cm [2].

- In 2002, Carbajo and Caballero (Spain) proposed a technical variation to prevent gastroesophageal (GE) bile reflux. They called their technique One Anastomosis Gastric Bypass (**OAGB**) or in spanish Bypass Gastrico de Una Anastomosis (BAGUA). According to this technique, OAGB has a latero-lateral anastomosis between the loop of jejunum and the pouch, and the distance to Treitz' ligament averages 250–350 cm [3].

2 Rutledge R. The mini-gastric bypass: experience with the first 1, 274 cases. Obes Surg. 2001;11(3):276–80.
3 Carbajo M, García-Caballero M, Toledano M, et al. One- anastomosis gastric bypass by laparoscopy: results of the first 209 patients. Obes Surg. 2005;15(3):398–404.

The Perfect Sleeve Gastrectomy

Conversione da Sleeve a OAGB

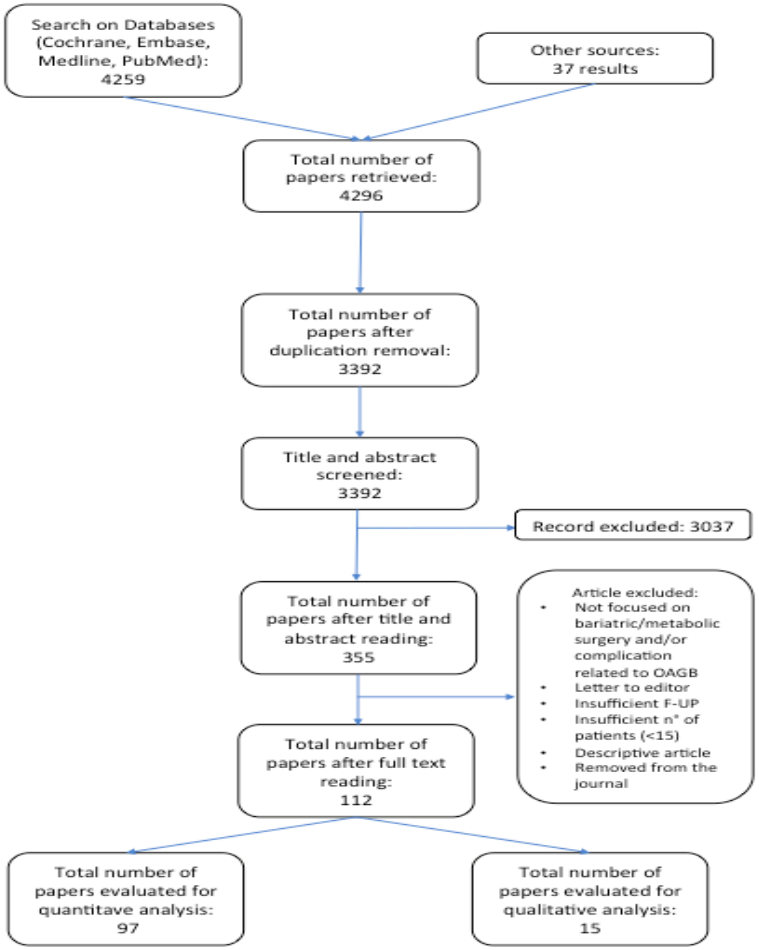
International Federation for the Surgery of Obesity and Metabolic Disorders (IFSO)
www.ifso.com

IFSO Update Position Statement on One Anastomosis Gastric Bypass (OAGB)

Maurizio De Luca[1], Giacomo Piatto[2], Giovanni Merola[3], Jacques Himpens[4], Jean-Marc Chevallier[5], Miguel –A Carbajo[6], Kamal Mahawar[7], Alberto Sartori[2], Nicola Clemente[2], Miguel Herrera[8], Kelvin Higa[9], Wendy A. Brown[10] and Scott Shikora[11]

Obesity Surgery, **May 2021**

Fig. 1 PRISMA FLOW CHART



The search was done in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement. We searched **MEDLINE** (December 2017 to February 2020), **EMBASE** (December 2017 to February 2020), **PubMed** (December 2017 to February 2020) and the **Cochrane Library** (December 2017 to February 2020).

The Perfect Sleeve Gastrectomy

Conversione da Sleeve a OAGB

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Obesity Surgery, May 2021

Recommendation of the IFSO OAGB Taskforce 2021

OAGB should remain the official IFSO approved identifier for this procedure.

The outcomes from OAGB are promising in terms of short operative time, low perioperative complication rate, good weight loss and good comorbidities remission (T2DM, HTN, OSAS and DL).

OAGB in the primary setting provides better weight loss, comorbidity reduction and fewer complications when compared to the outcomes when OAGB is performed as a revisional procedure.

At this stage, bile reflux does not seem to be a major issue for patients who have undergone OAGB and there have not been increased reports of esophageal or gastric cancer.

Whilst the data is currently lacking, long-term nutritional deficiencies due to the malabsorptive nature of OAGB procedures should be considered and patients should have at least an annual nutritional review and appropriate micro- and macro-nutrient supplementation

The Perfect Sleeve Gastrectomy

Conversione da Sleeve a OAGB

2020: European Association Endoscopic Surgery (EAES) Bariatric/Metabolic Surgery Guidelines

The Perfect Sleeve Gastrectomy

Conversione da Sleeve a OAGB

2020 EAES Bariatric/Metabolic Surgery Guidelines

THE METHODOLOGY

GRADE

APPRAISAL OF GUIDELINES RESEARCH & EVALUATION

AGREE II

GRADEpro GDT

European Association for Endoscopic Surgery and Other Interventional Techniques

The Perfect Sleeve Gastrectomy

Conversione da Sleeve a OAGB

2020 EAES Bariatric/Metabolic Surgery Guidelines

GRADEpro GDT

Bariatric surgery compared to non surgical management for weight loss

Certainty assessment							Summary of findings						
							№ of patients		Effect				
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Bariatric surgery	Non surgical management	Relative (95% CI)	Absolute (95% CI)	Certainty	Importance	
EWL (assessed with: %)													
1	randomised trials	serious	not serious	very serious	not serious	very strong association	20	24	-	MD **52.6 % higher** (42.07 higher to 63.13 higher)	⊕⊕⊕○ MODERATE	CRITICAL	
Post-intervention weight (assessed with: kg)													
4	randomised trials	serious	serious	serious	not serious	strong association	129	132	-	MD **19.25 lower** (26.94 lower to 11.57 lower)	⊕⊕○○ LOW	CRITICAL	
Complications													
10	randomised trials	serious	serious	serious	serious	publication bias strongly suspected	226/572 (39.5%)	109/423 (25.8%)	**OR 2.44** (1.47 to 4.06)	**201 more per 1.000** (from 80 more to 327 more)	⊕○○○ VERY LOW	CRITICAL	
Mortality													
10	randomised trials	serious	not serious	serious	not serious	none	0/393 (0.0%)	3/296 (1.0%)	**RD -0.01** (-0.03 to 0.01)	**10 more per 1.000** (from 10 fewer to 30 more)	⊕⊕○○ LOW	CRITICAL	
HbA1c (assessed with: mg/dL)													
7	randomised trials	serious	very serious	serious	not serious	none	289	220	-	MD **0.04 lower** (1.18 lower to 1.09 higher)	⊕○○○ VERY LOW	IMPORTANT	

The Perfect Sleeve Gastrectomy

Conversione da Sleeve a OAGB

2020 EAES Bariatric/Metabolic Surgery Guidelines TOPICS

Topic 1 Indications to surgery → Maurizio De Luca, Luca Busetto, Angelo di Vincenzo, Giacomo Piatto

Topic 2 Pre-operative work-up

Topic 3 Perioperative management

Topic 4 Bariatric Surgery: Adjustable Gastric Banding

Sleeve Gastrectomy

Roux-en-Y Gastric Bypass

One Anastomosis Gastric Bypass → Maurizio De Luca, Giacomo Piatto

BPD and BPD/DS

Topic 5 Revisional Surgery

Topic 6 Postoperative care

Topic 7 Investigational procedures

The Perfect Sleeve Gastrectomy

Conversione da Sleeve a OAGB

2019 EAES Bariatric/Metabolic Surgery Guidelines

Questions

1. Should OAGB vs. RYGB, gastric plication, gastric banding or sleeve gastrectomy be used for weight loss?

2. Should SADI-S vs BPD/DS, RYGB or sleeve gastrectomy be used for weight loss?

Position Statement (1)

OAGB may offer better short-term weight loss compared to RYGB, gastric plication, adjustable gastric banding or sleeve gastrectomy. Long-term comparative data are, however, lacking.

Recommendation (conditional) (2)

No recommendation for either SADI-S, BPD/DS, RYGB or sleeve gastrectomy can be made on the basis of available comparative evidence

The Perfect Sleeve Gastrectomy

Conversione da Sleeve a OAGB

Maurizi

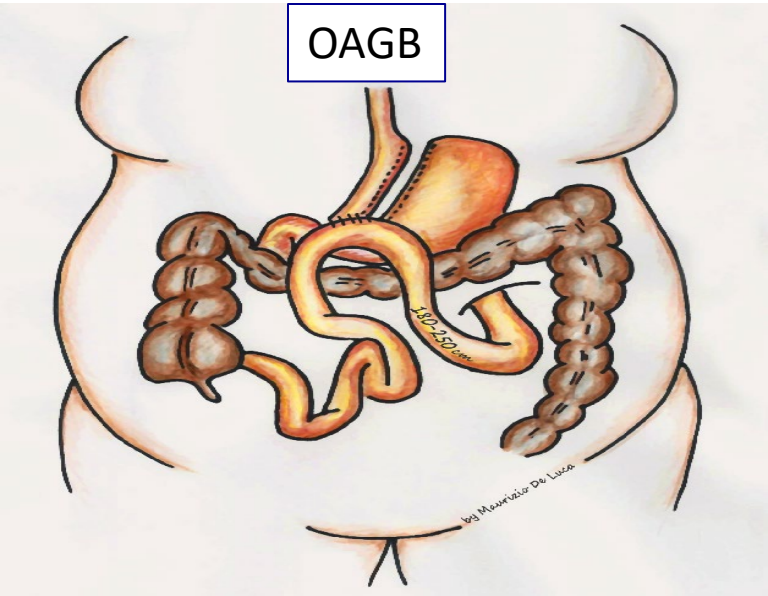
S.I.C.OB.

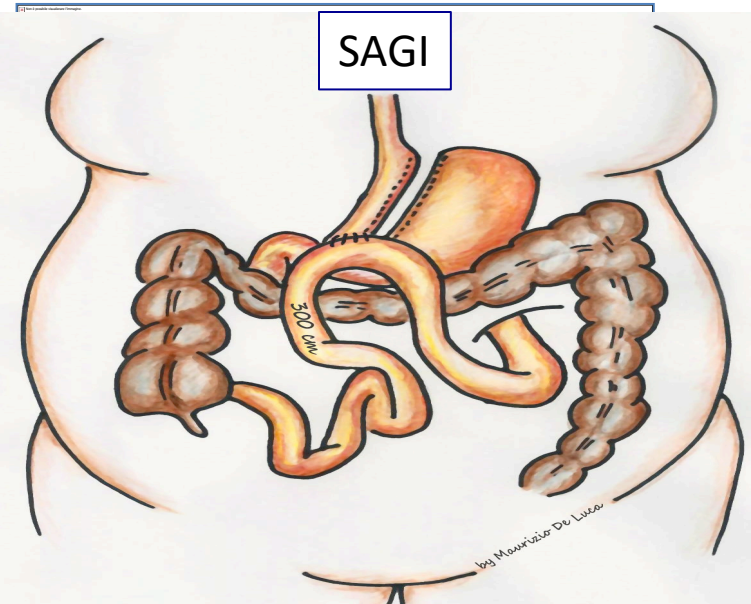
Single Anastomosis Gastric-Ileal (SAGI)

- Collis operation
- gastro-ileal anastomosis
- pure malapsorbitive procedure

INDICATIONS

1) Insufficient weight loss or weight regain after **Gastric Banding and Sleeve Gastrectomy**, especially when the reason of failure is related to patient lack of compliance, and not related to gastric pouch dilatation
2) Insufficient weight loss or weight regain after **OAGB/MGB**
3) primary surgery for OAGB/MGB candidate patients **with short small bowel**

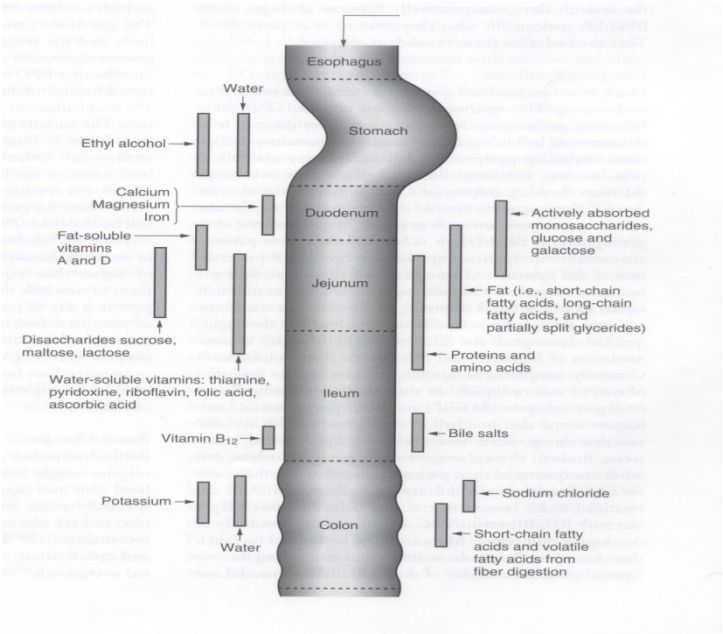




A New Concept In Surgery For Obesity And Weight Related Disease. Single Anastomosis Gastro-ileal (Sagi): Technical Details And Preliminary Results
Maurizio De Luca, Jacques Himpens, Luigi Angrisani, Nicola Di Lorenzo, Kamal Mahawar, Cesare Lunardi, Natale Pellicanò, Nicola Clemente And Scott Shikora.
Obesity Surgery, 2017, 27, 1, 143-147

Nutrients Most at Risk

- Iron
- Calcium
- Zinc
- VitaminD
- Vitamin A
- Vitamin K
- Protein



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Hamoui N, Chock B, Anthone G et al. *Revision of the duodenal switch: Indications, technique, and outcomes.* J Am College of Surgeons 2007;204:603-8.

The Perfect Sleeve Gastrectomy

Conversione da Sleeve a OAGB

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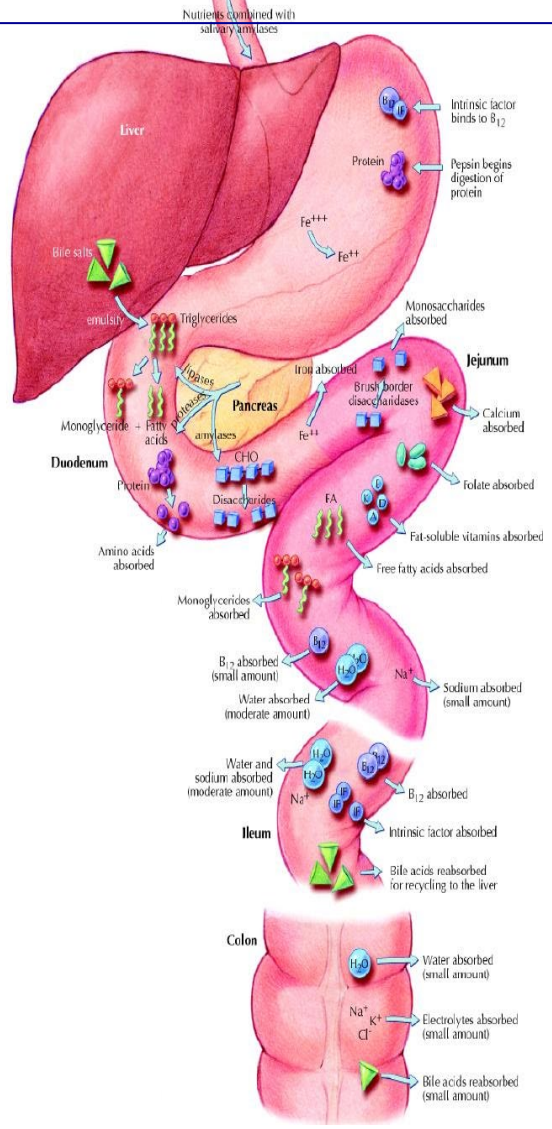

LSG

RYGB

OAGB

BPD/DS

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Post-bariatric surgery follow-up

Table 5. Major vitamins and minerals deficiencies after bariatric surgery: clinical manifestations and estimated frequency according to the bariatric procedure

Deficiency	Key clinical manifestations	Procedure-related frequency
Iron	microcytic anaemia	AGB + SG ++ RYGB, BPD, BPD/DS +++
Vitamin B12	megaloblastic anaemia neurologic abnormalities	SG, RYGB, BPD, BPD/DS ++
Vitamin D (and calcium)	bone demineralization increased risk of fractures	RYGB ++ BPD, BPD/DS +++
Vitamin A	ocular xerosis night blindness symptoms	BPD, BPD/DS +++
Vitamin E	anaemia ophthalmoplegia peripheral neuropathy	BPD, BPD/DS +++
Vitamin K	easy bleeding	BPD, BPD/DS +

AGB = Adjustable gastric banding; SG = sleeve gastrectomy; RYGB = gastric bypass; BPD = biliopancreatic diversion; BPD/DS = biliopancreatic diversion with duodenal switch.

ObesityFacts
The European Journal of Obesity

Obes Facts 2017;10:597–632

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Post-bariatric surgery follow-up

Table 6. Minimal periodic surveillance for nutritional deficiencies after bariatric surgery

	AGB	SG	RYGB	BPD – BPD/DS
Timing	every 6 months in the first year every 12 months thereafter	every 3–6 months in the first year every 12 months thereafter	every 3–6 months in the first year every 12 months thereafter	every 3 months in the first year every 6–12 months thereafter
Assessment	CBC, platelets electrolytes iron, ferritine vitamin B12 folate vitamin D PTH	CBC, platelets electrolytes iron, ferritine vitamin B12 folate vitamin D PTH	CBC, platelets Electrolytes iron, ferritine vitamin B12 folate vitamin D PTH 24-H U-calcium osteocalcin	CBC, platelets electrolytes iron, ferritine vitamin B12 folate vitamin D PTH 24-H U-calcium osteocalcin vitamin A vitamin E INR albumin prealbumin

AGB = Adjustable gastric banding; SG = sleeve gastrectomy; RYGB = gastric bypass; BPD = biliopancreatic diversion; BPD/DS = biliopancreatic diversion with duodenal switch. CBC = complete blood count; PTH = intact parathyroid hormone; 24-H U-calcium = 24-hour urinary calcium (modified [39]).

Obesity Facts
The European Journal of Obesity

Obes Facts 2017;10:597–632

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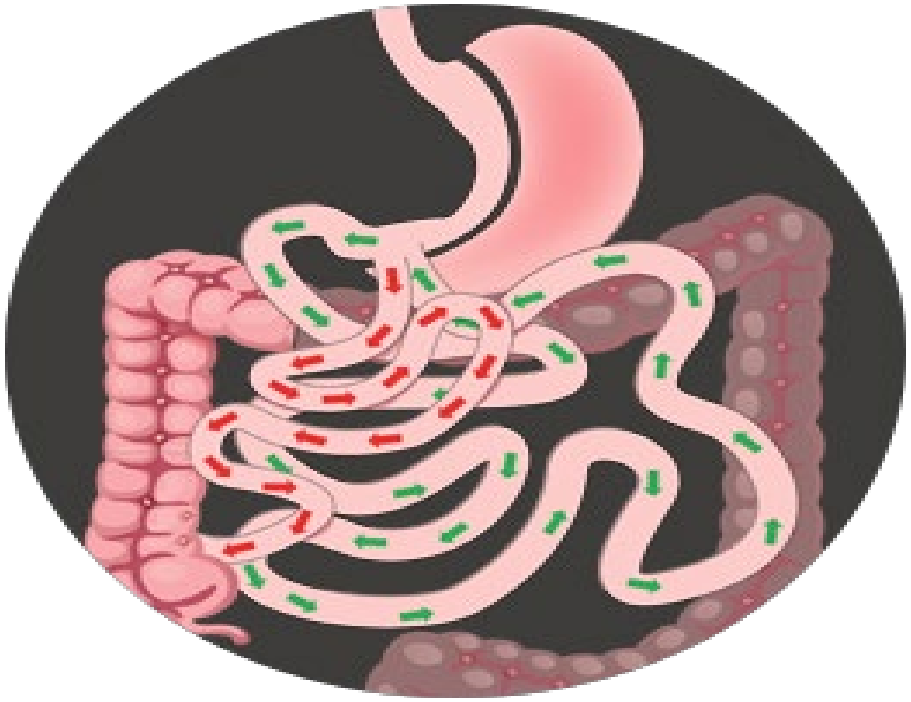
Sleeve Gastrectomy Transit Bipartition SG-TB

Single Anastomosis Sleeve Ileostomy SASI



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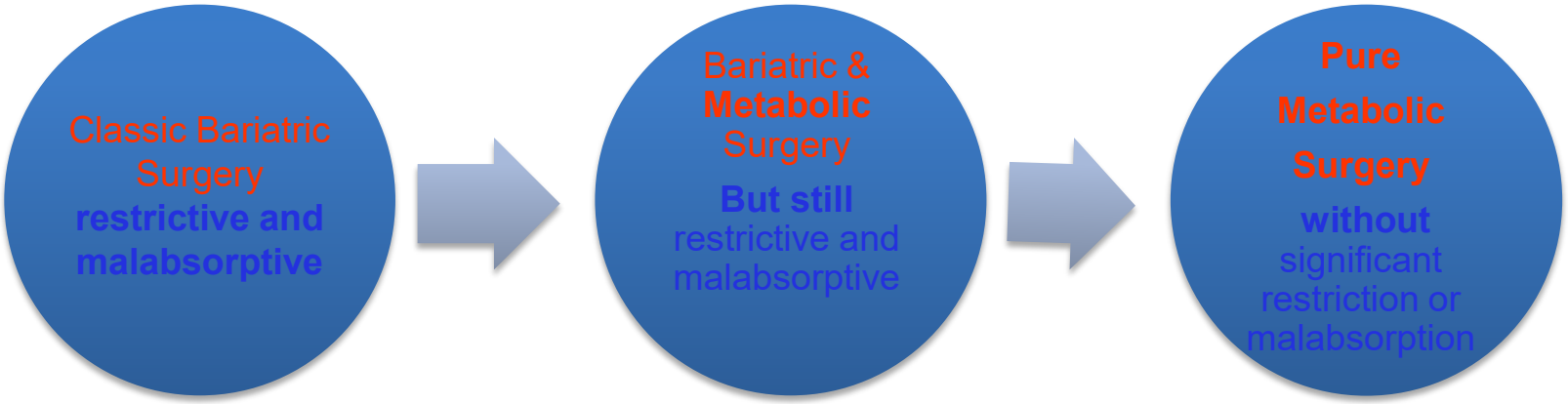
...my opinion...



Possibly, this is the birth of pure metabolic surgery, which is not bariatric, not mechanically restrictive and not malabsorptive.

Maurizio De Luca

S.I.C.OB.

Take home message 1

- Obesità è una malattia che dura **tutta la vita**
- Fondamentale è l'adeguata **selezione** dei pazienti
- Fondamentale è l'adeguata **informazione** ai pazienti
- Non esiste un intervento per tutti i pazienti

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Take home message 2

- Una inadeguata **selezione** porta inevitabilmente al **fallimento**
- Una inadeguata **informazione** porta inevitabilmente al **fallimento**
- Se l'intervento fallisce: **esame di coscienza**
- Fondamentale rivalutazione psicologica/psichiatrica

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Take home message 3

- Per ciascun fallimento, **molteplici opzioni terapeutiche**, mirate per ciascun paziente

- Non sempre la revisione/conversione chirurgica è la migliore risposta

- Fondamentale garantire un **follow-up** adeguato:
  - Nutrizionistico
  - Psicologico

S.I.C.OB.

Grazie